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# EXAMPLES IN ARITHMETIC.

## PART II.



EXAMPLES  
IN  
ARITHMETIC.

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PART II.

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# CONTENTS.

	PAGE
Vulgar Fractions . . . . .	154
Decimal Fractions . . . . .	178
Practice, Simple . . . . .	197
„ Compound . . . . .	202
Bills of Parcels . . . . .	212
Proportion, Simple . . . . .	214
„ Compound . . . . .	225
Per Centages . . . . .	230
Simple Interest . . . . .	234
Compound Interest . . . . .	238
Discount . . . . .	240
Stocks . . . . .	242
Proportional Parts . . . . .	244
Involution and Evolution . . . . .	247
EXAMINATION PAPERS . . . . .	253
TABLES OF COMPOUND INTEREST AND SPECIFIC GRAVITY . . . . .	297
ANSWERS TO THE EXAMPLES . . . . .	336
„ „ EXAMINATION PAPERS . . . . .	360





VULGAR FRACTIONS.

## Ex. I.

(1)	Express	4	as a fraction with denominator	2
(2)	„	5	„	3
(3)	„	7	„	5
(4)	„	3	„	16
(5)	„	14	„	7
(6)	„	17	„	9
(7)	„	13	„	15
(8)	„	23	„	4
(9)	„	9	„	8
(10)	„	15	„	3
(11)	„	26	„	10
(12)	„	117	„	9
(13)	„	38	„	7
(14)	„	51	„	11
(15)	„	73	„	18
(16)	„	86	„	63
(17)	„	96	„	71
(18)	„	105	„	25
(19)	„	71	„	24
(20)	„	58	„	19

## Ex. II.

Reduce to improper fractions :—

(1)	$1\frac{1}{2}$	(26)	$170\frac{4}{13}$
(2)	$1\frac{3}{4}$	(27)	$96\frac{1}{21}$
(3)	$2\frac{1}{2}$	(28)	$806\frac{8}{84}$
(4)	$7\frac{1}{4}$	(29)	$191\frac{7}{11}$
(5)	$8\frac{3}{4}$	(30)	$38\frac{3}{10}$
(6)	$9\frac{1}{5}$	(31)	$102\frac{10}{13}$
(7)	$3\frac{2}{3}$	(32)	$96\frac{3}{37}$
(8)	$9\frac{1}{3}$	(33)	$51\frac{7}{38}$
(9)	$11\frac{2}{3}$	(34)	$638\frac{2}{11}$
(10)	$5\frac{3}{8}$	(35)	$901\frac{5}{105}$
(11)	$9\frac{2}{3}$	(36)	$440\frac{3}{410}$
(12)	$15\frac{1}{15}$	(37)	$138\frac{1}{10}$
(13)	$105\frac{7}{8}$	(38)	$70\frac{3}{28}$
(14)	$12\frac{1}{13}$	(39)	$96\frac{1}{8}$
(15)	$78\frac{5}{8}$	(40)	$701\frac{30}{1070}$
(16)	$901\frac{7}{13}$	(41)	$137\frac{10}{212}$
(17)	$112\frac{5}{8}$	(42)	$699\frac{5}{80}$
(18)	$90\frac{10}{13}$	(43)	$13\frac{7}{125}$
(19)	$68\frac{2}{17}$	(44)	$116\frac{2}{133}$
(20)	$5\frac{7}{23}$	(45)	$79\frac{6}{182}$
(21)	$73\frac{1}{3}$	(46)	$435\frac{2}{117}$
(22)	$92\frac{1}{23}$	(47)	$9002\frac{4}{110}$
(23)	$16\frac{1}{4}$	(48)	$736\frac{8}{8}$
(24)	$15\frac{9}{10}$	(49)	$197\frac{2}{17}$
(25)	$11\frac{1}{12}$	(50)	$3016\frac{4}{12}$

## Ex. III.

Reduce to whole or mixed numbers :—

- |  |  |
|--|--|
| (1) $\frac{12}{3}, \frac{110}{11}$       | (26) $\frac{441}{63}, \frac{713}{84}$          |
| (2) $\frac{19}{3}, \frac{56}{9}$         | (27) $\frac{901}{111}, \frac{926}{58}$         |
| (3) $\frac{20}{7}, \frac{83}{5}$         | (28) $\frac{999}{37}, \frac{302}{29}$          |
| (4) $\frac{19}{6}, \frac{105}{7}$        | (29) $\frac{6271}{31}, \frac{5131}{731}$       |
| (5) $\frac{11}{2}, \frac{191}{17}$       | (30) $\frac{4469}{78}, \frac{7120}{35}$        |
| (6) $\frac{15}{7}, \frac{14}{3}$         | (31) $\frac{3912}{112}, \frac{1111}{101}$      |
| (7) $\frac{18}{5}, \frac{31}{7}$         | (32) $\frac{87642}{993}, \frac{7319}{562}$     |
| (8) $\frac{21}{7}, \frac{510}{17}$       | (33) $\frac{1571}{731}, \frac{4603}{651}$      |
| (9) $\frac{113}{9}, \frac{60}{7}$        | (34) $\frac{6991}{101}, \frac{7203}{513}$      |
| (10) $\frac{126}{8}, \frac{115}{19}$     | (35) $\frac{5010}{25}, \frac{739}{125}$        |
| (11) $\frac{145}{15}, \frac{361}{50}$    | (36) $\frac{69213}{833}, \frac{7130}{283}$     |
| (12) $\frac{710}{11}, \frac{173}{13}$    | (37) $\frac{7615}{15}, \frac{17091}{87}$       |
| (13) $\frac{99}{30}, \frac{88}{12}$      | (38) $\frac{9603}{181}, \frac{14511}{299}$     |
| (14) $\frac{720}{13}, \frac{901}{15}$    | (39) $\frac{4741}{384}, \frac{10032}{713}$     |
| (15) $\frac{75}{8}, \frac{2121}{7}$      | (40) $\frac{5968}{219}, \frac{39021}{631}$     |
| (16) $\frac{1196}{17}, \frac{1521}{26}$  | (41) $\frac{7956}{73}, \frac{4021}{17}$        |
| (17) $\frac{582}{39}, \frac{1103}{17}$   | (42) $\frac{8484}{120}, \frac{59021}{736}$     |
| (18) $\frac{51}{9}, \frac{281}{13}$      | (43) $\frac{6021}{59}, \frac{27031}{119}$      |
| (19) $\frac{283}{14}, \frac{520}{21}$    | (44) $\frac{3716}{19}, \frac{27434}{111}$      |
| (20) $\frac{1496}{217}, \frac{6031}{73}$ | (45) $\frac{18647}{29}, \frac{40139}{171}$     |
| (21) $\frac{3362}{63}, \frac{808}{102}$  | (46) $\frac{73131}{38}, \frac{91931}{79}$      |
| (22) $\frac{8261}{199}, \frac{731}{19}$  | (47) $\frac{14613}{872}, \frac{31993}{1551}$   |
| (23) $\frac{4775}{25}, \frac{1558}{93}$  | (48) $\frac{9091}{301}, \frac{5171}{527}$      |
| (24) $\frac{1112}{17}, \frac{501}{31}$   | (49) $\frac{87643}{992}, \frac{8391}{736}$     |
| (25) $\frac{602}{198}, \frac{7021}{91}$  | (50) $\frac{62136}{4170}, \frac{170312}{1517}$ |

## Ex. IV.

Reduce to their lowest terms:—

- |   |   |
|---|---|
| (1) $\frac{15}{35}, \frac{72}{95}$          | (26) $\frac{1395}{1488}, \frac{999}{1017}$      |
| (2) $\frac{18}{360}, \frac{125}{500}$       | (27) $\frac{7125}{17250}, \frac{8880}{14430}$   |
| (3) $\frac{12}{42}, \frac{13}{85}$          | (28) $\frac{5980}{10790}, \frac{791}{8020}$     |
| (4) $\frac{16}{90}, \frac{17}{153}$         | (29) $\frac{567}{1001}, \frac{1332}{1389}$      |
| (5) $\frac{36}{1080}, \frac{48}{1102}$      | (30) $\frac{153}{909}, \frac{9113}{9123}$       |
| (6) $\frac{37}{259}, \frac{18}{270}$        | (31) $\frac{378}{483}, \frac{8544}{8576}$       |
| (7) $\frac{14}{27}, \frac{53}{265}$         | (32) $\frac{2090}{4072}, \frac{4173}{12519}$    |
| (8) $\frac{78}{91}, \frac{84}{156}$         | (33) $\frac{9197}{11709}, \frac{103}{7519}$     |
| (9) $\frac{64}{512}, \frac{798}{1298}$      | (34) $\frac{1890}{1920}, \frac{2059}{21170}$    |
| (10) $\frac{51}{57}, \frac{11}{370}$        | (35) $\frac{1133}{1957}, \frac{2037}{2086}$     |
| (11) $\frac{77}{84}, \frac{32}{88}$         | (36) $\frac{2160}{2448}, \frac{361}{3800}$      |
| (12) $\frac{35}{50}, \frac{510}{1700}$      | (37) $\frac{591}{1578}, \frac{1775}{1925}$      |
| (13) $\frac{93}{155}, \frac{89}{95}$        | (38) $\frac{29908}{20480}, \frac{4210}{73805}$  |
| (14) $\frac{714}{918}, \frac{791}{1017}$    | (39) $\frac{893}{2310}, \frac{444}{1760}$       |
| (15) $\frac{90}{105}, \frac{7916}{15508}$   | (40) $\frac{660}{708}, \frac{924}{1008}$        |
| (16) $\frac{4484}{5605}, \frac{729}{810}$   | (41) $\frac{1452}{1848}, \frac{713}{9617}$      |
| (17) $\frac{101}{109}, \frac{763}{1414}$    | (42) $\frac{477}{756}, \frac{168}{512}$         |
| (18) $\frac{133}{181}, \frac{2021}{5035}$   | (43) $\frac{703}{4107}, \frac{4729}{9063}$      |
| (19) $\frac{99}{153}, \frac{39}{780}$       | (44) $\frac{299}{2835}, \frac{7070}{127360}$    |
| (20) $\frac{1098}{2520}, \frac{1219}{7788}$ | (45) $\frac{9664}{9696}, \frac{1926}{1071}$     |
| (21) $\frac{63}{117}, \frac{212}{265}$      | (46) $\frac{1197}{1477}, \frac{5802}{64056}$    |
| (22) $\frac{330}{570}, \frac{147}{2856}$    | (47) $\frac{140}{3948}, \frac{3822}{4200}$      |
| (23) $\frac{791}{798}, \frac{1590}{1850}$   | (48) $\frac{7171}{32118}, \frac{9477}{10539}$   |
| (24) $\frac{126}{441}, \frac{150}{225}$     | (49) $\frac{79}{4819}, \frac{8307}{72900}$      |
| (25) $\frac{1515}{1616}, \frac{3913}{7839}$ | (50) $\frac{12423}{13653}, \frac{13690}{99900}$ |

## Ex. V.

Reduce to their least common denominator:—

- |   |  |
|---|--|
| (1) $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$                       | (26) $\frac{4}{37}, \frac{15}{111}, \frac{1}{3}, \frac{22}{21}$                        |
| (2) $\frac{1}{3}, \frac{1}{6}, \frac{1}{9}$                       | (27) $\frac{3}{4}, \frac{7}{8}, \frac{12}{25}, \frac{11}{40}$                          |
| (3) $\frac{2}{3}, \frac{3}{4}, \frac{5}{8}$                       | (28) $\frac{15}{16}, \frac{17}{18}, \frac{13}{20}, \frac{11}{12}$                      |
| (4) $\frac{1}{5}, \frac{3}{20}, \frac{4}{25}$                     | (29) $\frac{1}{2}, \frac{7}{8}, \frac{5}{6}, \frac{7}{12}$                             |
| (5) $\frac{2}{3}, \frac{3}{14}, \frac{3}{25}$                     | (30) $\frac{9}{10}, \frac{11}{10}, \frac{13}{20}, \frac{21}{20}$                       |
| (6) $\frac{1}{11}, \frac{2}{23}, \frac{1}{11}, \frac{7}{22}$      | (31) $\frac{17}{20}, \frac{13}{20}, \frac{3}{4}, \frac{13}{20}$                        |
| (7) $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{5}{12}$         | (32) $\frac{6}{8}, \frac{7}{8}, \frac{31}{40}, \frac{49}{20}$                          |
| (8) $\frac{5}{6}, \frac{4}{9}, \frac{7}{18}, \frac{11}{12}$       | (33) $\frac{2}{3}, \frac{11}{15}, \frac{21}{45}, \frac{34}{45}$                        |
| (9) $\frac{2}{3}, \frac{3}{15}, \frac{9}{11}, \frac{2}{5}$        | (34) $\frac{7}{10}, \frac{11}{12}, \frac{13}{18}, \frac{5}{6}$                         |
| (10) $\frac{1}{4}, \frac{3}{8}, \frac{5}{8}, \frac{7}{12}$        | (35) $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$                 |
| (11) $\frac{2}{3}, \frac{4}{9}, \frac{5}{13}, \frac{61}{117}$     | (36) $\frac{10}{20}, \frac{7}{20}, \frac{13}{20}, \frac{7}{20}, \frac{1}{3}$           |
| (12) $\frac{4}{5}, \frac{5}{9}, \frac{7}{10}, \frac{3}{45}$       | (37) $\frac{13}{18}, \frac{2}{20}, \frac{2}{25}, \frac{21}{24}, \frac{11}{11}$         |
| (13) $\frac{2}{3}, \frac{11}{12}, \frac{14}{15}, \frac{17}{10}$   | (38) $\frac{15}{18}, \frac{17}{18}, \frac{17}{18}, \frac{18}{18}, \frac{19}{18}$       |
| (14) $\frac{9}{10}, \frac{11}{12}, \frac{5}{7}, \frac{5}{6}$      | (39) $\frac{2}{3}, \frac{7}{24}, \frac{9}{16}, \frac{5}{8}, \frac{29}{48}$             |
| (15) $\frac{4}{9}, \frac{7}{27}, \frac{2}{3}, \frac{8}{11}$       | (40) $\frac{13}{18}, \frac{21}{24}, \frac{3}{4}, \frac{2}{3}, \frac{59}{60}$           |
| (16) $\frac{11}{15}, \frac{5}{6}, \frac{2}{3}, \frac{10}{10}$     | (41) $\frac{12}{17}, \frac{5}{17}, \frac{31}{34}, \frac{8}{17}, \frac{2}{17}$          |
| (17) $\frac{112}{113}, \frac{2}{5}, \frac{10}{20}, \frac{3}{10}$  | (42) $\frac{4}{37}, \frac{5}{9}, \frac{13}{27}, \frac{70}{111}, \frac{889}{999}$       |
| (18) $\frac{6}{7}, \frac{7}{8}, \frac{5}{14}, \frac{11}{28}$      | (43) $\frac{11}{32}, \frac{11}{32}, \frac{11}{32}, \frac{11}{40}, \frac{11}{42}$       |
| (19) $\frac{4}{21}, \frac{5}{7}, \frac{4}{9}, \frac{1}{3}$        | (44) $\frac{4}{5}, \frac{9}{310}, \frac{11}{62}, \frac{22}{20}$                        |
| (20) $\frac{2}{8}, \frac{9}{12}, \frac{9}{16}, \frac{5}{18}$      | (45) $\frac{9}{202}, \frac{17}{17}, \frac{31}{38}, \frac{29}{21}$                      |
| (21) $\frac{13}{18}, \frac{13}{18}, \frac{13}{20}, \frac{13}{24}$ | (46) $\frac{41}{102}, \frac{11}{21}, \frac{17}{18}, \frac{13}{18}$                     |
| (22) $\frac{14}{14}, \frac{15}{15}, \frac{16}{16}, \frac{5}{21}$  | (47) $\frac{5}{8}, \frac{6}{7}, \frac{7}{8}, \frac{8}{9}, \frac{9}{10}, \frac{11}{12}$ |
| (23) $\frac{3}{5}, \frac{7}{7}, \frac{11}{11}, \frac{2}{2}$       | (48) $\frac{9}{24}, \frac{10}{21}, \frac{17}{132}, \frac{20}{110}, \frac{68}{110}$     |
| (24) $\frac{13}{18}, \frac{13}{20}, \frac{13}{22}, \frac{3}{8}$   | (49) $\frac{19}{22}, \frac{1}{3}, \frac{7}{8}, \frac{5}{6}, \frac{2}{3}$               |
| (25) $\frac{5}{24}, \frac{1}{18}, \frac{6}{7}, \frac{13}{14}$     | (50) $\frac{2}{5}, \frac{5}{9}, \frac{7}{11}, \frac{6}{7}, \frac{8}{21}, \frac{1}{3}$  |

## EX. VI.

Express as a simple fraction:—

- |  |   |
|--|---|
| (1) $\frac{1}{2}$ of $\frac{1}{4}$   | (26) $2\frac{1}{2}$ of $1\frac{1}{4}$ of $2\frac{1}{2}$                                     |
| (2) $\frac{1}{2}$ of $\frac{3}{4}$   | (27) $\frac{1}{2}$ of $\frac{1}{4}$ of $\frac{1}{3}$ of 1                                   |
| (3) $\frac{2}{3}$ of $\frac{5}{6}$   | (28) $\frac{1}{7}$ of $\frac{1}{6}$ of $\frac{1}{9}$ of 63                                  |
| (4) $1\frac{1}{2}$ of $1\frac{3}{4}$   | (29) $6\frac{3}{4}$ of $\frac{8}{9}$ of $\frac{7}{8}$ of $\frac{5}{6}$                      |
| (5) $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{1}{4}$                                    | (30) $1\frac{1}{2}$ of $\frac{5}{6}$ of $1\frac{9}{10}$ of $3\frac{1}{3}$                   |
| (6) $\frac{2}{5}$ of $\frac{3}{4}$ of $2\frac{5}{6}$                                   | (31) $15\frac{1}{3}$ of $2\frac{7}{9}$ of $1\frac{5}{4}$                                    |
| (7) $1\frac{9}{10}$ of $\frac{2}{3}$ of $\frac{7}{8}$                                  | (32) $1\frac{1}{4}$ of $\frac{8}{9}$ of $3\frac{1}{3}$ of $3\frac{2}{3}$                    |
| (8) $1\frac{1}{2}$ of $\frac{7}{8}$ of $\frac{5}{6}$                                   | (33) $11\frac{2}{3}$ of $2\frac{2}{3}$ of $5\frac{1}{2}$ of 7                               |
| (9) $\frac{4}{7}$ of $\frac{3}{4}$ of $2\frac{9}{11}$                                  | (34) $9\frac{1}{7}$ of $3\frac{7}{2}$ of $\frac{7}{8}$ of 7                                 |
| (10) $1\frac{9}{11}$ of $1\frac{1}{2}$ of $1\frac{1}{10}$                              | (35) $\frac{4}{5}$ of $\frac{3}{4}$ of $2\frac{1}{2}$ of $6\frac{1}{2}$                     |
| (11) $\frac{2}{3}$ of $\frac{3}{4}$ of 4   | (36) $1\frac{3}{4}$ of $1\frac{9}{10}$ of $16\frac{2}{3}$ of $\frac{1}{5}$                  |
| (12) $\frac{8}{9}$ of $\frac{7}{8}$ of 5   | (37) $13\frac{1}{7}$ of $5\frac{2}{3}$ of $4\frac{1}{2}$ of $5\frac{7}{10}$                 |
| (13) $\frac{5}{6}$ of $\frac{3}{4}$ of $2\frac{1}{2}$                                  | (38) $1\frac{1}{10}$ of 11 of $1\frac{5}{11}$ of 9  |
| (14) $1\frac{1}{2}$ of $4\frac{1}{2}$  | (39) $\frac{1}{7}$ of $\frac{1}{9}$ of $1\frac{1}{11}$ of 63                                |
| (15) $3\frac{3}{4}$ of $7\frac{1}{4}$  | (40) $4\frac{2}{5}$ of $8\frac{1}{2}$ of $\frac{5}{6}$ of 4                                 |
| (16) $19\frac{1}{11}$ of $120\frac{1}{4}$  | (41) $1\frac{1}{8}$ of $1\frac{2}{3}$ of $\frac{5}{6}$ of $2\frac{1}{4}$                    |
| (17) $2\frac{3}{4}$ of $1\frac{4}{5}$ of $\frac{7}{8}$                                 | (42) $25\frac{3}{4}$ of $17\frac{1}{2}$ of $3\frac{2}{5}$ of $10\frac{3}{5}$                |
| (18) $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$ of $\frac{5}{6}$ | (43) $15\frac{2}{11}$ of $2\frac{3}{4}$ of $1\frac{4}{7}$                                   |
| (19) $1\frac{1}{2}$ of $1\frac{2}{3}$ of $\frac{7}{8}$ of $\frac{5}{6}$                | (44) $1\frac{1}{2}$ of $\frac{1}{2}$ of 2 of 3  |
| (20) $3\frac{3}{4}$ of $7\frac{3}{8}$ of $1\frac{1}{5}$ of $2\frac{1}{3}$              | (45) $5\frac{1}{4}$ of $1\frac{2}{3}$ of $1\frac{3}{8}$ of $\frac{1}{2}$                    |
| (21) $11\frac{1}{2}$ of $5\frac{1}{4}$ of $5\frac{1}{4}$                               | (46) $90\frac{1}{5}$ of $2\frac{1}{2}$ of $7\frac{1}{4}$ of $4\frac{2}{5}$                  |
| (22) $\frac{2}{3}$ of $\frac{2}{3}$ of $\frac{3}{4}$ of 6                              | (47) $6\frac{2}{3}$ of $6\frac{1}{3}$ of $8\frac{1}{4}$ of 7                                |
| (23) $1\frac{1}{8}$ of $\frac{8}{9}$ of 5  | (48) $\frac{5}{6}$ of $\frac{7}{8}$ of $3\frac{1}{2}$ of $11\frac{5}{6}$                    |
| (24) $2\frac{7}{8}$ of $6\frac{1}{4}$ of $\frac{2}{3}$ of $1\frac{1}{2}$               | (49) $\frac{1}{8}$ of $1\frac{1}{9}$ of $6\frac{1}{3}$ of $1\frac{7}{8}$ of $30\frac{1}{3}$ |
| (25) $1\frac{1}{2}$ of $1\frac{2}{3}$ of $5\frac{1}{8}$ of $1\frac{1}{7}$              | (50) $\frac{7}{8}$ of $1\frac{1}{4}$ of $2\frac{2}{3}$ of $1\frac{1}{8}$ of 56              |

## Ex. VII.

Find the value of :—

- |  |  |
|--|--|
| (1) $\frac{1}{2} + \frac{1}{4} + \frac{1}{8}$                      | (26) $\frac{1}{10} + \frac{3}{8} + \frac{5}{6} + \frac{1}{9}$                          |
| (2) $\frac{1}{3} + \frac{1}{6} + \frac{1}{9}$                      | (27) $\frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \frac{5}{6}$                           |
| (3) $\frac{1}{7} + \frac{1}{8} + \frac{1}{9}$                      | (28) $\frac{5}{6} + \frac{6}{7} + \frac{7}{8} + \frac{8}{9}$                           |
| (4) $\frac{1}{4} + \frac{1}{5} + \frac{1}{6}$                      | (29) $\frac{8}{9} + \frac{9}{10} + \frac{1}{11} + \frac{1}{12}$                        |
| (5) $\frac{1}{3} + \frac{1}{5} + \frac{1}{6}$                      | (30) $1\frac{2}{3} + 2\frac{1}{4} + 6\frac{1}{5} + 2\frac{5}{6}$                       |
| (6) $\frac{1}{2} + \frac{2}{7} + \frac{3}{4}$                      | (31) $1\frac{2}{7} + 3\frac{3}{4} + 2\frac{2}{3} + 1\frac{1}{2}$                       |
| (7) $\frac{1}{2} + \frac{2}{3} + \frac{3}{4}$                      | (32) $4\frac{3}{4} + 3\frac{3}{5} + 2\frac{2}{3} + 5\frac{1}{2}$                       |
| (8) $\frac{2}{3} + \frac{7}{8} + \frac{8}{9}$                      | (33) $8\frac{2}{5} + 6\frac{6}{7} + 3\frac{3}{4} + 1\frac{3}{6}$                       |
| (9) $\frac{5}{6} + \frac{6}{7} + \frac{7}{8}$                      | (34) $5\frac{9}{10} + 2\frac{4}{5} + 1\frac{9}{10} + \frac{1}{3}$                      |
| (10) $\frac{2}{5} + \frac{4}{5} + \frac{6}{5}$                     | (35) $6\frac{3}{4} + 3\frac{1}{8} + 3\frac{3}{8} + 6\frac{7}{8}$                       |
| (11) $\frac{7}{10} + \frac{5}{20} + \frac{4}{5}$                   | (36) $11\frac{2}{9} + 15\frac{8}{11} + 6\frac{3}{33} + 5\frac{2}{3}$                   |
| (12) $\frac{1}{17} + \frac{2}{51} + \frac{3}{17}$                  | (37) $17\frac{2}{17} + 6\frac{3}{11} + 18\frac{1}{55} + 1\frac{1}{7}$                  |
| (13) $\frac{3}{4} + \frac{5}{12} + \frac{5}{8}$                    | (38) $10\frac{3}{13} + 1\frac{9}{39} + 6\frac{2}{13} + 5\frac{5}{15}$                  |
| (14) $\frac{9}{7} + \frac{7}{8} + \frac{8}{9}$                     | (39) $7\frac{1}{9} + 5\frac{9}{6} + 4\frac{3}{6} + 18\frac{1}{10}$                     |
| (15) $\frac{4}{5} + \frac{9}{10} + \frac{1}{7}$                    | (40) $5\frac{1}{8} + 6\frac{1}{7} + 7\frac{1}{8} + 9\frac{1}{12}$                      |
| (16) $\frac{9}{9} + \frac{7}{11} + \frac{3}{9}$                    | (41) $1\frac{3}{8} + 7\frac{1}{8} + 8\frac{4}{8} + 3\frac{7}{9}$                       |
| (17) $\frac{1}{11} + \frac{7}{11} + \frac{1}{11}$                  | (42) $6\frac{2}{7} + 1\frac{8}{7} + 1\frac{1}{2}$ of $1\frac{1}{11}$                   |
| (18) $1\frac{3}{4} + \frac{6}{70} + \frac{1}{2}$                   | (43) $\frac{2}{3}$ of $\frac{3}{4} + \frac{5}{6}$ of $\frac{7}{9}$                     |
| (19) $1\frac{1}{2} + \frac{7}{8} + \frac{1}{2}$                    | (44) $2\frac{2}{3}$ of $\frac{9}{10}$ of $\frac{7}{8}$ of $\frac{1}{2} + 6\frac{2}{3}$ |
| (20) $\frac{7}{10} + \frac{1}{25} + \frac{9}{25}$                  | (45) $1\frac{1}{2}$ of $5\frac{1}{3} + \frac{9}{10}$ of $1\frac{1}{3} + 5\frac{1}{4}$  |
| (21) $1\frac{3}{11} + 1\frac{5}{17} + \frac{8}{34} + \frac{9}{22}$ | (46) $6\frac{3}{4}$ of $\frac{4}{9}$ of $5 + \frac{2}{3}$ of $18$                      |
| (22) $\frac{1}{20} + \frac{3}{16} + \frac{1}{16} + \frac{3}{8}$    | (47) $\frac{7}{8}$ of $5\frac{8}{9}$ of $7 + 1\frac{2}{3}$ of $\frac{9}{10}$           |
| (23) $\frac{2}{5} + \frac{3}{7} + \frac{3}{11} + \frac{3}{14}$     | (48) $\frac{1}{2}$ of $7 + \frac{3}{4}$ of $\frac{5}{8} + 9\frac{1}{2}$                |
| (24) $\frac{4}{5} + \frac{7}{8} + 1\frac{1}{5} + \frac{8}{9}$      | (49) $20\frac{1}{3} + 9\frac{1}{3}$ of $\frac{2}{4} + 7\frac{1}{2}$                    |
| (25) $\frac{7}{8} + \frac{2}{21} + \frac{5}{6} + \frac{2}{3}$      | (50) $6\frac{2}{7}$ of $\frac{2}{3}$ of $7 + 3\frac{1}{2}$ of $\frac{7}{8}$            |



## EX. VIII.

- |  |  |
|--|--|
| (1) $\frac{1}{2} - \frac{1}{3}$                  | (26) $\frac{1}{2} + \frac{2}{3} - \frac{2}{5}$   |
| (2) $\frac{6}{7} - \frac{4}{5}$                  | (27) $\frac{3}{8} + \frac{7}{8} - \frac{6}{7}$   |
| (3) $1\frac{2}{3} - \frac{3}{4}$                 | (28) $1\frac{2}{11} + 3\frac{1}{11} - 4\frac{1}{20}$                                   |
| (4) $\frac{5}{8} - 1\frac{5}{14}$                | (29) $\frac{1}{2} + \frac{2}{3} + \frac{3}{4} - \frac{5}{9}$                           |
| (5) $\frac{7}{8} - \frac{2}{7}$                  | (30) $7\frac{1}{2} + \frac{2}{3} - 5\frac{1}{9}$                                       |
| (6) $1\frac{9}{10} - 1\frac{4}{11}$              | (31) $6\frac{3}{4} + \frac{7}{8} - 5\frac{1}{8}$                                       |
| (7) $3\frac{7}{2} - 1\frac{3}{6}$                | (32) $1\frac{1}{2} - \frac{5}{9}$ of $\frac{1}{2}$                                     |
| (8) $1\frac{7}{8} - 1\frac{1}{2}$                | (33) $\frac{2}{7}$ of $3\frac{1}{14} - \frac{3}{9}$                                    |
| (9) $\frac{2}{5} - 1\frac{5}{10}$                | (34) $\frac{4}{5}$ of $\frac{5}{9} - \frac{1}{3}$                                      |
| (10) $\frac{4}{5} - 1\frac{7}{5}$                | (35) $3\frac{2}{3}$ of $1\frac{1}{11} - 3\frac{1}{4}$                                  |
| (11) $2\frac{1}{11} - 1\frac{4}{5}$              | (36) $8\frac{1}{9}$ of $2\frac{1}{2} - 4\frac{1}{3}$ of $1\frac{1}{4}$                 |
| (12) $8\frac{2}{3} - 1\frac{1}{15}$              | (37) $\frac{1}{7}$ of $1\frac{1}{5} - \frac{1}{3}$ of $\frac{1}{4}$                    |
| (13) $5\frac{2}{7} - 3\frac{2}{9}$               | (38) $2\frac{2}{9}$ of $1\frac{3}{10} - \frac{5}{6}$ of $2\frac{3}{10}$                |
| (14) $1\frac{1}{2} - \frac{4}{7}$                | (39) $\frac{1}{2} + \frac{1}{3}$ of $\frac{1}{4} - 1\frac{1}{10}$                      |
| (15) $3\frac{5}{8} - 2\frac{3}{4}$               | (40) $2\frac{1}{2} - 1\frac{3}{4}$ of $1\frac{1}{2}$                                   |
| (16) $14\frac{1}{5} - 2\frac{1}{7}$              | (41) $1\frac{1}{4}$ of $1\frac{7}{10}$ of $\frac{3}{8} - \frac{1}{2}$ of $\frac{1}{8}$ |
| (17) $11\frac{3}{8} - 5\frac{1}{2}$              | (42) $5\frac{1}{4} + 2\frac{1}{8} - 9\frac{1}{8}$ of $1\frac{3}{4}$                    |
| (18) $6\frac{3}{8} - 5\frac{1}{8}$               | (43) $6\frac{2}{7}$ of $1\frac{5}{11} - 1\frac{5}{8}$ of $2\frac{1}{8}$                |
| (19) $1\frac{5}{8} - 1\frac{2}{10}$              | (44) $\frac{3}{5}$ of $\frac{1}{7} + 1\frac{9}{11} - \frac{3}{7}$                      |
| (20) $12\frac{1}{10} - 10\frac{4}{5}$            | (45) $1\frac{2}{3}$ of $1\frac{1}{2}$ of $\frac{7}{5} - \frac{2}{5}$ of $\frac{1}{9}$  |
| (21) $116\frac{2}{3} - 15\frac{1}{30}$           | (46) $7\frac{1}{8}$ of $1\frac{1}{9} - \frac{6}{7}$ of $2\frac{1}{2}$                  |
| (22) $7\frac{9}{10} - 2\frac{2}{3}$              | (47) $9\frac{1}{10}$ of $1\frac{9}{10} - \frac{1}{4}$ of $\frac{1}{5}$ of 6            |
| (23) $6\frac{3}{4} - 4\frac{1}{5} 1\frac{7}{2}$  | (48) $3\frac{3}{4} + 1\frac{3}{7} + \frac{6}{7}$ of $2\frac{1}{3} - 5$                 |
| (24) $8 - 6\frac{4}{7}$                          | (49) $1 - \frac{1}{2}$ of $\frac{3}{4}$ of $\frac{5}{8}$ of $\frac{7}{9}$              |
| (25) $5\frac{3}{11} - 4\frac{1}{2} 1\frac{3}{4}$ | (50) $1\frac{3}{4} + \frac{7}{8}$ of $2\frac{5}{11} - \frac{6}{7}$ of $1\frac{3}{11}$  |

## Ex. IX.

- (1)  $\frac{4}{5} \times \frac{5}{9}$
- (2)  $\frac{3}{4} \times \frac{7}{8}$
- (3)  $\frac{9}{11} \times \frac{13}{15}$
- (4)  $\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4}$
- (5)  $\frac{7}{8} \times \frac{8}{9} \times \frac{9}{10}$
- (6)  $\frac{5}{6} \times \frac{11}{12} \times \frac{12}{11}$
- (7)  $\frac{7}{9} \times \frac{8}{15} \times \frac{10}{14}$
- (8)  $\frac{11}{12} \times \frac{9}{10} \times \frac{1}{11}$
- (9)  $1\frac{1}{2} \times \frac{2}{3} \times \frac{4}{5}$
- (10)  $1\frac{5}{8} \times 2\frac{7}{10} \times 3\frac{3}{4}$
- (11)  $2\frac{3}{4} \times 5\frac{1}{4} \times 3\frac{7}{8} \times \frac{1}{2}$
- (12)  $6\frac{4}{5} \times \frac{20}{170} \times \frac{15}{11} \times 7\frac{2}{3}$
- (13)  $\frac{1}{3} \times \frac{3}{5} \times \frac{5}{7} \times \frac{8}{9} \times 7$
- (14)  $1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4} \times 1$
- (15)  $3 \times 3\frac{1}{4} \times 3\frac{1}{2} \times \frac{8}{13}$
- (16)  $\frac{1}{4} \times \frac{1}{5} \times \frac{6}{7} \times \frac{9}{10}$
- (17)  $\frac{11}{12} \times \frac{5}{8} \times \frac{6}{11} \times \frac{4}{7}$
- (18)  $9\frac{1}{2} \times 1\frac{1}{4} \times \frac{5}{13}$
- (19)  $2\frac{1}{2} \times 3\frac{1}{4} \times 6\frac{6}{7} \times \frac{1}{8}$
- (20)  $15\frac{1}{3} \times \frac{7}{18} \times \frac{9}{25} \times \frac{5}{34}$
- (21)  $1\frac{2}{3} \times \frac{8}{10} \times \frac{1}{17} \times \frac{7}{10}$
- (22)  $\frac{1}{2} \times \frac{3}{4} \times \frac{5}{8} \times \frac{8}{9} \times \frac{1}{12}$
- (23)  $6\frac{2}{3} \times 73\frac{1}{8} \times \frac{30}{81} \times 5$
- (24)  $11\frac{2}{3} \times \frac{1}{7} \times 9\frac{1}{10} \times \frac{1}{13}$
- (25)  $5\frac{1}{7} \times 1\frac{8}{9} \times \frac{1}{17} \times \frac{4}{5}$
- (26)  $1\frac{2}{3}$  of  $\frac{7}{8}$  of  $\frac{1}{5} \times 6\frac{1}{2} \times \frac{8}{9}$
- (27)  $1\frac{1}{4}$  of  $1\frac{1}{2} \times \frac{3}{5}$  of 2
- (28)  $\frac{1}{2}$  of  $\frac{3}{4} \times \frac{6}{7}$  of  $\frac{4}{5}$
- (29)  $10 \times \frac{9}{10} \times \frac{5}{9}$  of 8
- (30)  $3\frac{1}{2}$  of  $\frac{5}{6} \times 51 \times \frac{1}{9}$
- (31)  $\frac{7}{8} + (\frac{2}{3} \text{ of } \frac{3}{4} \times \frac{4}{5})$
- (32)  $(1\frac{1}{2} \times \frac{2}{3}) + (\frac{5}{6} \text{ of } \frac{4}{5})$
- (33)  $\frac{1}{2}$  of 7 +  $(3\frac{1}{5} \times \frac{7}{8})$
- (34)  $(4\frac{3}{4} + \frac{1}{2} \text{ of } 4\frac{3}{4} \text{ of } \frac{1}{10}) \times 6$
- (35)  $2\frac{1}{3}$  of  $\frac{6}{7} - 1\frac{1}{2}$  of  $1\frac{1}{4}$
- (36)  $(5\frac{1}{3} \times \frac{9}{10}) + \frac{1}{12}$  of 2
- (37)  $1\frac{1}{9} \times \frac{9}{10} \times \frac{7}{8}$
- (38)  $(\frac{2}{3} \times \frac{1}{17} \text{ of } \frac{1}{2}) - \frac{4}{5}$
- (39)  $19\frac{1}{4}$  of  $\frac{8}{11}$  of  $3 - 15\frac{3}{4}$
- (40)  $1 \times \frac{1}{2} \times \frac{1}{7} \times \frac{1}{9} \times 2$
- (41)  $1\frac{9}{10} \times 7\frac{1}{2} \times \frac{1}{5} \times 4$
- (42)  $\frac{1}{2}$  of  $\frac{2}{3} + \frac{3}{4}$  of  $1\frac{1}{8}$
- (43)  $2\frac{2}{9} \times 5\frac{1}{8} \times 8\frac{3}{4} \times \frac{5}{350}$
- (44)  $1\frac{4}{9} \times \frac{9}{10} \times \frac{1}{8} \times 4$
- (45)  $5\frac{2}{3}$  of  $\frac{1}{7} + \frac{1}{11}$  of  $\frac{5}{8}$
- (46)  $1\frac{1}{2} \times 2\frac{2}{3} \times 3\frac{3}{4} \times 4\frac{4}{5}$
- (47)  $\frac{1}{7} \times \frac{1}{10}$  of  $\frac{3}{4}$  of  $\frac{5}{6}$  of 7
- (48)  $2\frac{1}{2}$  of  $\frac{4}{5}$  of  $\frac{7}{9}$  of  $3 - \frac{7}{10}$
- (49)  $(1\frac{1}{3} \times \frac{9}{10} \text{ of } 7) - \frac{2}{3}$  of  $5\frac{1}{2}$
- (50)  $(17\frac{3}{10} \times 9\frac{1}{8}) - (8\frac{3}{4} \times 7\frac{2}{3})$

## EX. X.

- (1)  $1\frac{1}{2} \div \frac{2}{3}$
- (2)  $3\frac{3}{4} \times \frac{1}{2} \div \frac{5}{7}$
- (3)  $\frac{1}{2} \times \frac{5}{7} \div 4$
- (4)  $\frac{2}{7} \times \frac{3}{4} \div 7$
- (5)  $\frac{1}{9}$  of  $\frac{1}{2} \div 6\frac{1}{3}$
- (6)  $11\frac{1}{10} \div 11\frac{1}{10}$
- (7)  $6\frac{1}{4} \times \frac{1}{2} \div 275$
- (8)  $1\frac{2}{3}$  of  $\frac{3}{4} \div \frac{7}{8}$
- (9)  $\frac{1}{12}$  of  $\frac{5}{8}$  of  $\frac{7}{11} \div 3\frac{3}{4}$
- (10)  $\frac{4}{9}$  of  $\frac{3}{4} \div \frac{8}{9}$  of  $\frac{9}{10}$
- (11)  $1\frac{2}{3}$  of  $\frac{7}{18} \div \frac{5}{8}$  of  $\frac{7}{8}$
- (12)  $1\frac{9}{11}$  of  $\frac{2}{3} \div \frac{7}{11}$  of 14
- (13)  $19\frac{1}{3} \div \frac{1}{2}$  of  $\frac{1}{5}$
- (14)  $11\frac{2}{3} \div \frac{3}{8}$  of  $\frac{5}{9}$
- (15)  $1\frac{9}{10} \times \frac{7}{8}$  of  $\frac{2}{1} \div \frac{4}{7}$
- (16)  $5\frac{1}{8}$  of  $\frac{1}{3} \div \frac{5}{8}$  of  $\frac{7}{10}$
- (17)  $8\frac{1}{3} \div \frac{5}{8}$  of  $\frac{5}{7}$
- (18)  $6\frac{7}{8}$  of  $\frac{9}{10} \div \frac{1}{3}$
- (19)  $(\frac{1}{2} + \frac{2}{3}) \div 7$
- (20)  $(\frac{1}{9} - \frac{1}{3}) \div 6$
- (21)  $(\frac{5}{8} - \frac{1}{3}) \div \frac{4}{7}$
- (22)  $(\frac{1}{8} + 2\frac{1}{2}) \div \frac{4}{7}$  of  $\frac{7}{8}$
- (23)  $5\frac{1}{2}$  of  $\frac{2}{3} \div (\frac{1}{2} + \frac{2}{3})$
- (24)  $(\frac{1}{4} + \frac{1}{5} + \frac{1}{12}) \div \frac{7}{8}$
- (25)  $(1\frac{1}{2} + \frac{1}{3}) \div \frac{7}{8}$  of 24
- (26)  $12\frac{1}{4} \div (19\frac{1}{8} + 7)$
- (27)  $(3\frac{1}{8} + 1\frac{5}{8}) \div (3\frac{1}{8} + 2\frac{1}{4})$
- (28)  $(4\frac{1}{2} - 2\frac{1}{3}) \div (1\frac{1}{4} - \frac{3}{8})$
- (29)  $(20\frac{1}{2}$  of  $4\frac{1}{2}) \div (\frac{1}{40}$  of  $4\frac{1}{4})$
- (30)  $(2\frac{1}{2} \div 3\frac{1}{8}) + \frac{1}{6} + \frac{7}{8}$
- (31)  $5\frac{2}{3} \div (\frac{2}{3} + \frac{1}{4} - \frac{1}{6})$
- (32)  $(6 - \frac{1}{10}) \div \frac{4}{7}$  of 3
- (33)  $1\frac{1}{2}$  of  $3\frac{1}{2} \div (\frac{1}{5} + \frac{3}{12})$
- (34)  $(11\frac{1}{2} - 2\frac{1}{3}) \div (7\frac{1}{6} + 1\frac{1}{4})$
- (35)  $(18\frac{3}{4} + 5\frac{1}{2}) \div \frac{7}{8}$  of  $\frac{5}{8}$
- (36)  $(19\frac{1}{10} + 3\frac{1}{5} - 1\frac{1}{4}) \div \frac{7}{10}$
- (37)  $15\frac{7}{12} \div 1\frac{1}{2}$  of  $1\frac{7}{8}$
- (38)  $\frac{2}{3}$  of  $\frac{3}{4}$  of  $\frac{1}{5} \div 1\frac{1}{2}$  of  $\frac{7}{16}$
- (39)  $11\frac{1}{3}$  of  $\frac{9}{10} \div \frac{1}{18} \times \frac{4}{5}$
- (40)  $1 \div \frac{7}{8}$  of  $\frac{3}{4}$
- (41)  $1\frac{1}{6} \div (9\frac{1}{10} + \frac{3}{16})$
- (42)  $(2\frac{3}{4} + \frac{6}{7} + \frac{3}{8}) \div (1\frac{1}{2} + \frac{3}{4})$
- (43)  $7\frac{1}{3}$  of  $5\frac{2}{7} \div 3\frac{7}{8}$
- (44)  $1\frac{7}{8} \div (1\frac{3}{4} \div \frac{1}{2})$
- (45)  $(9\frac{1}{3}$  of  $\frac{7}{11}$  of  $\frac{3}{4}) \div (\frac{7}{8}$  of  $1\frac{5}{8})$
- (46)  $(7\frac{1}{8} + 2\frac{2}{3}) \div (\frac{4}{7} \times \frac{5}{8})$
- (47)  $(1 \div \frac{3}{8}) \div (1\frac{1}{2}$  of 6)
- (48)  $(8\frac{1}{2} \div 3\frac{1}{4}) \div 2\frac{1}{6}$  of  $1\frac{2}{3}$
- (49)  $(5\frac{1}{8} \div \frac{3}{8})$  of  $\frac{7}{8}$  of 3
- (50)  $2\frac{1}{2} \div (1\frac{1}{4} \div 1\frac{7}{8} + 3\frac{3}{4})$

## EX. XI.

Simplify the following :

- (1)  $4 - \frac{\frac{1}{2} + \frac{1}{4}}{\frac{3}{4} - \frac{6}{17}}$
- (2)  $\frac{7}{12}$  of  $\frac{3\frac{1}{4}}{11\frac{1}{2} - 2\frac{1}{3}}$  of  $6\frac{1}{3}$
- (3)  $5\frac{1}{2} - \frac{3 + 1\frac{1}{4}}{6\frac{2}{7} \times \frac{8}{9}}$
- (4)  $6 + \frac{1\frac{1}{11} - 1\frac{3}{4}}{5\frac{1}{4} + 1\frac{3}{4}}$
- (5)  $\frac{14\frac{1}{3}}{7\frac{1}{8}} - \frac{1\frac{1}{4} - \frac{2}{3}}{4\frac{1}{4}}$
- (6)  $\frac{9\frac{1}{2}}{11\frac{1}{2}}$  of  $\frac{1}{5\frac{3}{4}}$  of  $7\frac{1}{2}$
- (7)  $\frac{2\frac{3}{4}}{5\frac{1}{2}}$  of  $7\frac{1}{2}$  of  $\frac{9\frac{1}{10}}{6\frac{1}{2}}$  of  $5\frac{1}{4}$  of  $49$
- (8)  $1\frac{3}{4} + 1\frac{7}{8}$  of  $\frac{5\frac{1}{2}}{3\frac{2}{3}}$  of  $\frac{1}{2}$
- (9)  $\frac{1}{1 - \frac{2}{3}}$  of  $\frac{1}{1 + \frac{2}{3}}$
- (10)  $7 + \frac{5 - \frac{2}{3} \text{ of } \frac{7}{4}}{\frac{6\frac{2}{3}}{6\frac{2}{3}}}$
- (11)  $\frac{5\frac{1}{4}}{4\frac{5}{8}}$  of  $\frac{7\frac{1}{9}}{3\frac{1}{2}}$  of  $\frac{7}{13}$
- (12)  $4\frac{2}{3}$  of  $\frac{\frac{3}{6}}{14 \times 27}$  of  $9$
- (13)  $\frac{6\frac{1}{4} \text{ of } 2\frac{1}{3}}{1\frac{3}{4} - \frac{7}{9}} - \frac{15\frac{1}{6} - 9\frac{1}{10}}{3\frac{7}{8} \text{ of } 11\frac{1}{2}}$
- (14)  $1 - \left( \frac{\frac{1}{2} + \frac{1}{3}}{1 + \frac{1}{4}} \text{ of } 1\frac{1}{2} \right)$
- (15)  $\frac{3\frac{6}{7} \text{ of } 9\frac{1}{3} + 1\frac{1}{2}}{7\frac{1}{4} - \frac{1}{3} \text{ of } 9}$
- (16)  $\frac{17 - 3\frac{1}{4} + 7\frac{1}{3}}{8\frac{1}{2} \text{ of } 1\frac{1}{9}}$  of  $\frac{\frac{5}{6} \text{ of } \frac{7}{8}}{2\frac{1}{4}}$
- (17)  $1 - \frac{1 - \frac{1}{2}}{1 + \frac{1}{2}}$
- (18)  $5 - \frac{\frac{1}{2} \text{ of } \frac{2}{3}}{9}$  of  $\frac{5\frac{1}{4} \text{ of } \frac{1}{9}}{1\frac{1}{2}}$
- (19)  $\frac{7}{\frac{3}{4}} - \left( \frac{\frac{3}{8} \text{ of } 6}{1\frac{2}{3}} \text{ of } \frac{1}{1 - \frac{1}{3}} \right)$
- (20)  $\frac{19\frac{1}{4} \text{ of } 3\frac{1}{3}}{1\frac{2}{3}\frac{2}{3}} - \frac{9\frac{3}{10} \text{ of } 5\frac{1}{2}}{11 \times 6\frac{1}{5}}$
- (21)  $\frac{8\frac{2}{3} - (6\frac{7}{8} \text{ of } \frac{8}{17})}{4\frac{2}{9} - \frac{5}{8}} - \frac{10\frac{2}{11}}{1\frac{2}{3}\frac{3}{3} \times 6}$
- (22)  $\frac{1}{2 \times \frac{1}{4}} + \left( \frac{\frac{3 \times \frac{7}{4}}{5}}{7\frac{1}{3} \times 1\frac{1}{2}} \div \frac{1}{\frac{7}{4}} \right)$
- (23)  $3\frac{3}{4} + \frac{1 - \frac{1}{9}}{7\frac{1}{3} \times \frac{4}{9}} - 1\frac{5}{8}$
- (24)  $(6\frac{1}{2} \div 3\frac{1}{2}) \times \frac{5}{2\frac{1}{3} \text{ of } 1\frac{2}{3}\frac{7}{9}}$

## Ex. XII.

- (1) Add £3. 1. 6½, £9. 2. 11⅞, £2. 19. 5⅞, £7. 13. 9½
- (2) „ £4. 7. 9¼, £1. 1. 9¾, £6. 1. 7⅞, £5. 0. 9¾
- (3) „ £8. 2. 6¾, £6. 19. 6⅞, £1. 15. 6¾, £3. 2. 11⅞
- (4) „ £3. 19. 7⅞, £5. 4. 2¾, £9. 0. 7⅞, £10. 10. 10¾
- (5) „ £8. 14. 7⅞, £9. 13. 8¾, £5. 0. 6¼, £9. 2. 6¼
- (6) „ £4. 4. 9¾, £3. 16. 2⅞, £8. 0. 1¼, £9. 6. 7¼
- (7) „ £6. 1. 3¾, £2. 4. 2¼, £9. 2. 6⅞, £7. 12. 11⅞
- (8) „ £3. 1. 5½, £4. 6. 2¾, £6. 1. 3¾, £9. 7. 6⅞
- (9) „ £5. 5. 5½, £4. 2. 6⅞, £11. 0. 11⅞, £8. 2. 1½
- (10) „ £4. 6. 8¾, £1. 5. 4⅞, £8. 1. 6⅞, £2. 1. 9½
- (11) From £6. 13. 7¼ take £5. 19. 4⅞
- (12) „ £3. 1. 6½ take £2. 11. 10¼
- (13) „ £4. 19. 1 take £4. 17. 5¾
- (14) „ £8. 0. 6¾ take £1. 11. 10¾
- (15) „ £9. 5. 8¼ take £5. 15. 9⅞
- (16) „ £9. 16. 8¼ take £6. 15. 11¾
- (17) „ £101. 13. 2¾ take £29. 16. 8¾
- (18) „ £117. 5. 0 take £61. 3. 8¼
- (19) „ £58. 2. 0½ take £57. 1. 2¼
- (20) „ £70. 5. 7¼ take £36. 8. 9⅞
- (21) Multiply £3. 1. 6⅞ by 18
- (22) „ £1. 17. 7¾ by 63
- (23) „ £3. 1. 6⅞ by 36
- (24) „ £2. 1. 4 by ⅞
- (25) „ £9. 16. 3 by ⅞
- (26) „ £3. 17. 6 by ⅞
- (27) „ £5. 19. 9½ by 84
- (28) „ £7. 8. 8¾ by 5¾
- (29) „ £8. 1. 5¾ by 7¼
- (30) „ £9. 3. 10⅞ by 8¼
- (31) „ 5 cwt. 3 qrs. 14 lbs. by 3¾
- (32) „ 6 tons 11 cwt. 3 qrs. 5 lbs. by 6¼

- (33) Multiply 5 ac. 3 r.  $3\frac{3}{4}$  po. by  $11\frac{1}{7}$   
 (34) „ 11 lbs. 8 oz. 5 dwts. 6 grs. by  $7\frac{9}{16}$   
 (35) „ 13 qrs. 5 bus. 2 pks. by  $6\frac{2}{15}$   
 (36) „ 11 dys. 5 hrs.  $13\frac{3}{4}$  min. by  $9\frac{1}{12}$   
 (37) „ 1 m. 1 fur.  $58\frac{3}{4}$  yds. by  $8\frac{1}{7}$   
 (38) „ 15 yds. 2 ft. 9 in. by  $6\frac{3}{4}$   
 (39) „ 86 yds. 2 qrs. 2 nls. 1 in. by  $11\frac{1}{3}$   
 (40) „ 5 cub. yds. 1 ft. 110 in. by  $8\frac{1}{3}\frac{2}{3}$   
 (41) Divide £3. 1. 9 by  $\frac{2}{3}$   
 (42) „ £1. 11. 4 by  $1\frac{1}{3}$   
 (43) „ £3. 6. 8 by  $\frac{2}{7}$   
 (44) „ £10. 11.  $1\frac{1}{2}$  by  $\frac{5}{8}$   
 (45) „ £55. 4. 7 by  $6\frac{1}{10}$   
 (46) „ £3. 9.  $6\frac{3}{4}$  by  $1\frac{1}{11}$   
 (47) „ £8. 11.  $11\frac{1}{2}$  by  $5\frac{2}{7}$   
 (48) „ £1002. 16. 1 by  $3\frac{3}{8}$   
 (49) „ £501. 19.  $10\frac{1}{4}$  by  $1\frac{1}{2}$  of  $\frac{2}{3}$   
 (50) „ £73. 8.  $2\frac{1}{2}$  by  $\frac{5}{8}$  of  $4\frac{1}{2}$   
 (51) „ 11 ac. 2 r. 12 po. by  $3\frac{1}{3}$   
 (52) „ 9 lbs. 5 oz. 8 drs. by  $6\frac{1}{4}$   
 (53) „ 3 qrs. 3 bus. 1 pk. by  $\frac{7}{8}$   
 (54) „ 100 yrs. 31 days 20 hrs. by  $8\frac{4}{5}$   
 (55) „ 33 m. 5 fur. 28 po. 4 yds. by  $2\frac{1}{4}$   
 (56) „ 5 sq. yds. 8 ft. 110 in. by  $7\frac{2}{7}$   
 (57) „ 1021 yds. 1 ft.  $11\frac{1}{2}$  in. by  $2\frac{3}{4}$   
 (58) „ 36 tons 11 cwt. 15 lbs. by  $90\frac{1}{3}$   
 (59) „ 1 cwt. 1 qr. 12 lbs. by  $\frac{1}{3}\frac{9}{8}$   
 (60) „ 105 lbs. 5 oz. 2 drs. 2 sc. 10 grs. by  $\frac{3}{4}$   
 (61) Find the value of  $\frac{2}{3}$  of £1 + £10. 1.  $6\frac{1}{2} \times \frac{1}{4}$   
 (62) „  $\frac{1}{4}$  of £1 +  $\frac{1}{5}$  of 2s. 6d. +  $\frac{2}{3}$  of 6s. 8d. +  $\frac{2}{3}$  of 6s.  
 (63) „  $\frac{2}{3}$  of 2s. 6d. +  $\frac{4}{5}$  of £2 -  $\frac{1}{4}$  of  $2\frac{1}{2}$  guineas  
 (64) „  $\frac{1}{3}$  of  $\frac{3}{4}$  of 5s. -  $\frac{1}{2}$  of  $\frac{3}{4}$  of 1s.  
 (65) „  $\frac{1}{2}$  ( $\frac{7}{10} - \frac{5}{12}$ ) of 6s. +  $\frac{2}{3}$  of  $\frac{5}{6}$  of  $6\frac{3}{4}$ d.  
 (66) „  $\frac{1}{3}$  of  $\frac{1}{4}$  of  $2\frac{1}{2}$  guineas +  $\frac{2}{3}$  of £7 +  $1\frac{1}{12}$  of 6s. 8d.  
 (67) „  $\frac{1}{9}$  of  $\frac{1}{7}$  of 3 guineas +  $\frac{1}{11}$  of  $\frac{1}{4}$  of 5s. 6d.  
 (68) „  $2\frac{2}{3}$  of £2 +  $3\frac{1}{8}$  of  $1\frac{3}{8}$  of 10s.  
 (69) „  $3\frac{1}{8}$  of £1 +  $1\frac{1}{8}$  of 1s. +  $1\frac{5}{16}$  of £2 -  $\frac{2}{3}$  of 2 guineas  
 (70) „  $1\frac{3}{4}$  of a crown +  $\frac{5}{6}$  of 3d. -  $\frac{7}{6}$  of 6s.

- (71) Find the value of  $\frac{1}{3}\mathcal{L} + \frac{1}{3}s. + \frac{1}{3}d.$   
 (72) „  $\frac{2}{3}\mathcal{L} + \frac{1}{3}s. - \frac{1}{2}$  of 2s.  
 (73) „  $6\frac{1}{4}$  of  $2\frac{1}{3}$  of a guinea  $- 6\frac{1}{4}$  of  $2\frac{1}{3}$  of  $\mathcal{L}1$   
 (74) „  $\frac{1}{2}$  of a guinea  $+ \frac{1}{2}$  of  $\mathcal{L}1 + \frac{1}{2}$  of half-a-crown  
 $+ \frac{1}{2}$  of 1s.  
 (75) „  $\frac{2}{3}$  of  $\frac{7}{8}$  of 2s. 6d.  $+ \frac{1}{3}$  of  $1\frac{1}{4}$  of 5s. 4d.  $- \frac{2}{30}$  of  
 7s. 6d.  
 (76) „  $\frac{1}{2}$  of 1 ton 3 cwt.  
 (77) „  $\frac{1}{11}$  of 1 cwt. 3 qrs. 12 lbs.  
 (78) „  $\frac{2}{5}$  of 3 lbs. 5 oz. 4 drs.  
 (79) „  $\frac{1}{3}$  of  $\frac{1}{2}$  of 2 qrs.  $+ \frac{1}{3}$  of 2 tons 1 cwt.  
 (80) „  $\frac{1}{4}$  of  $\frac{1}{5}$  of 3 lbs. 4 oz. Troy  $+ 3\frac{3}{4}$  of 3 lbs. 6 oz.  
 Troy  
 (81) „  $2\frac{1}{2} \times 5760$  grains  $+ 1\frac{3}{4}$  of  $1\frac{1}{2}$  of  $2\frac{1}{2}$  lbs. Troy  
 (82) „  $2\frac{1}{11}$  of 1 qr. 5 lbs.  $+ \frac{5}{6}$  of 2 tons 10 cwt.  
 (83) „  $\frac{2}{3}$  of a ton  $+ \frac{2}{3}$  of a cwt.  $+ \frac{1}{2}$  of 2 qrs.  
 (84) „  $1\frac{1}{2}$  of  $\frac{2}{3}$  of 5 cwt. 7 lbs.  $+ \frac{1}{3}$  of 2 tons 5 cwt.  
 $+ \frac{1}{3}$  of 3 tons 3 cwt.  
 (85) „  $\frac{1}{2}$  of  $\frac{2}{3}$  of  $\frac{7}{8}$  of 1 cub. yard  $+ \frac{2}{3}$  of 1 cub. ft.  
 (86) „  $(11 \text{ cwt.} \div \frac{2}{3}) + (5 \text{ lbs. } 7 \text{ oz.} \div \frac{3}{4}) - 2 \text{ qrs. } 4 \text{ lbs.}$   
 (87) „  $(1 \text{ m.} \div \frac{2}{3}) - (2 \text{ fur. } 18 \text{ yds.} \times \frac{3}{4}) + (\frac{1}{2} \text{ mile} \div \frac{2}{3})$   
 (88) „  $\frac{2}{3}$  of  $\frac{3}{4}$  of  $5\frac{1}{4}$  miles  $+ \frac{3}{4}$  of 3 po.  $+ \frac{1}{12}$  of 1 fur.  
 (89) „  $\frac{1}{10}$  of 1 hr.  $+ 1\frac{1}{2}$  of  $\frac{2}{3}$  of 2 h. 30 m.  $+ (1\frac{1}{4} \text{ h.} \div \frac{2}{3})$   
 (90) „  $\frac{9}{10}$  of 2 dys.  $+ \frac{3}{8}$  of 5 hrs.  $- \frac{1}{12}$  of 7 hrs. 30 min.  
 (91) „  $\frac{2}{3}$  of  $3\frac{1}{2}$  ac.  $+ \frac{2}{3}$  of 7 po.  $+ (5 \text{ sq. yds. } 7 \text{ ft.} \times \frac{2}{3})$   
 (92) „  $\frac{1}{3}$  of  $\frac{1}{5}$  of  $2\frac{1}{2}$  ft.  $+ \frac{3}{4}$  of 2 ft. 9 in.  $- \frac{1}{2}$  of  $5\frac{1}{4}$  in.  
 (93) „  $\frac{1}{8}$  bus.  $+ \frac{2}{3}$  pks.  $+ \frac{2}{3}$  gals.  $+ \frac{2}{3}$  pints  
 (94) „  $\frac{1}{4}$  of  $\frac{3}{4}$  of 9 qrs. 6 bus.  $+ \frac{1}{3}$  of 5 bus. 2 pks.  
 (95) „  $\frac{1}{5}$  mile  $+ \frac{2}{3}$  fur.  $+ \frac{3}{5}$  pole  $+ \frac{4}{5}$  yard  
 (96) „  $\frac{1}{2}$  ( $\frac{2}{3}$  of  $\frac{3}{4}$  of 5 hrs.)  $+ \frac{2}{3}$  ( $\frac{1}{2}$  of  $\frac{4}{5}$  of 15 minutes)  
 (97) „  $\{4\frac{1}{2} (\frac{1}{2} \text{ of } \frac{4}{5}) - 3\frac{1}{4} (\frac{2}{3} \text{ of } \frac{3}{4})\}$  of 5 tons  
 (98) „  $1\frac{1}{4}$  tons  $- \frac{2}{3}$  of 17 cwt. 3 qrs.  
 (99) „  $3\frac{2}{3}$  of 7 m. 5 fur.  $- 1\frac{3}{4}$  of 10 m. 6 fur.  
 (100) „  $\frac{1}{15}$  of 1 ton  $+ \frac{1}{15}$  of 1 cwt.  $+ \frac{1}{15}$  of 1 qr.  $+ \frac{1}{15}$   
 of 1 lb.

## Ex. XIII.

(1)	Reduce	2s. 6d.	to the fraction of	£1
(2)	"	5s. 4d.	"	£1
(3)	"	13s. 4d.	"	£1
(4)	"	3s. 8d.	"	10s.
(5)	"	9s. 10d.	"	£2. 10. 0
(6)	"	5s. 6½d.	"	£1. 0. 5
(7)	"	3s. 2¼d.	"	£7
(8)	"	8½d.	"	4s. 6d.
(9)	"	11¼d.	"	6d.
(10)	"	2¾d.	"	1s.
(11)	"	1s. 9d.	"	5s.
(12)	"	11s. 8½d.	"	3s. 9d.
(13)	"	7s. 2½d.	"	15s.
(14)	"	1s. 11¾d.	"	29s.
(15)	"	23s. 4d.	"	£1. 5. 0
(16)	"	19s. 3d.	"	£1. 15. 7
(17)	"	3s. 9d.	"	12s. 6d.
(18)	"	6s. 8d.	"	1½ guineas
(19)	"	1s. 3¾d.	"	11s. 9d.
(20)	"	8s. 7d.	"	5s.
(21)	"	£1. 2. 9	"	£2
(22)	"	£7. 3. 6	"	£10. 10. 0
(23)	"	£1. 5. 7½	"	£20. 10. 0
(24)	"	£6. 3. 4½	"	£10. 10. 0
(25)	"	£1. 9. 0¼	"	£4. 7. 6¼
(26)	"	£5. 9. 9	"	£5. 0. 0
(27)	"	£4. 17. 2½	"	£1. 0. 0
(28)	"	£3. 10. 10	"	£18. 18. 0
(29)	"	£1. 3. 8½	"	£1. 7. 0
(30)	"	£2. 1. 6¼	"	£1. 13. 4
(31)	"	£10. 3. 6¼	"	£11. 11. 6
(32)	"	5 half-crowns	"	7½ florins



(33)	Reduce 103 threepences to the fraction of 71 fourpences		
(34)	69 sixpences	58	half-crowns
(35)	£73. 12. 9	£100	
(36)	£3. 1. $2\frac{1}{4}$	£12. 16. 0	
(37)	37 half-crowns	119	sixpences
(38)	23 shillings	£15. 10. 9	
(39)	175 crowns	£9. 3. 4	
(40)	38 farthings	2s. 6d.	
(41)	113 half-pence	10s.	
(42)	5 cwts.	2 tons 10 cwt.	
(43)	13 lbs.	1 qr. 11 lbs.	
(44)	3 cwts. 1 qr.	5 cwt. 3 qrs.	
(45)	1 cwt. 1 qr. 7 lbs.	1 cwt.	
(46)	5 lbs. 13 oz.	1 qr. 1 lb. 1 oz.	
(47)	3 lbs. $3\frac{1}{2}$ oz.	2 qrs. 5 lbs.	
(48)	2 ft. 6 in.	1 yard	
(49)	3 ft. $7\frac{1}{2}$ in.	2 yds. 1 ft.	
(50)	5 bus. 2 pks.	2 qrs. 3 bus.	
(51)	1 gal. 3 qts.	70 pints	
(52)	5 ft. 10 in.	4 yards	
(53)	3 yds. 2 ft.	1 mile	
(54)	6 m. 5 fur.	10 miles	
(55)	3 r. 15 po.	1 acre	
(56)	2 ac. 3 r. 12 po.	5 acres	
(57)	1 lb. 2 oz. 5 dwts.	3 lb. 10 oz.	
(58)	$2\frac{1}{2}$ gals.	1 firkin	
(59)	13 gals. 2 qts.	1 hhd.	
(60)	5 sq. ft.	7 sq. yds. 1 ft.	
(61)	18 ac. 3 r. 12 po.	100 ac.	
(62)	$5\frac{1}{2}$ hours	1 week	
(63)	$35\frac{1}{2}$ hours	1 day	
(64)	5 h. $37\frac{1}{2}$ m.	6 h. 20 m.	
(65)	88 dys.	52 wks.	
(66)	1 c. ft. 117 in.	2 c. yds.	
(67)	38 lbs. 2 oz.	1 cwt. 1 qr.	
(68)	5 dys. 13 h. 12 m.	$14\frac{1}{2}$ days	
(69)	11 hrs. 19 m.	$3\frac{1}{4}$ hours	
(70)	1 lb. 5 oz. 10 dwt.	6 lb. 3 oz.	
(71)	150 grs.	1 lb. Troy	

(72)	Reduce	161 lbs. Troy	to the fraction of 1 cwt.
(73)	"	5 bus. 3 pks.	" " 1 qr. 3 pks.
(74)	"	3 bus. 2 pks.	" " 2 qrs. 1 bus. 2 pks.
(75)	"	12½ acres	" " 10 sq. miles
(76)	"	5 c. yds. 10 ft. 16 in.	" " 11 cub. yds.
(77)	"	5 fur. 30 yds.	" " 1 mile
(78)	"	110 sq. poles	" " 2 ac. 3 r.
(79)	"	1 yd. 1 qr. 2 n. 0½ in.	" " 3 yds. 1 ft.
(80)	"	5 yds. 3 qrs. 1 n. 0¾ in.	" " 11 Eng. ells

## Ex. XIV.

(1)	Reduce	1½s.	to the fraction of 10s.
(2)	"	£2⅔	" " £3.
(3)	"	3s. 8¾d.	" " 5s.
(4)	"	6s. 9½d.	" " 6s. 1¾d.
(5)	"	8s. 9¾d.	" " 11s. 6d.
(6)	"	1s. 2½d.	" " 2s. 10½d.
(7)	"	5½d.	" " 1s.
(8)	"	£1⅝	" " a guinea
(9)	"	£1⅔	" " 2½ guineas
(10)	"	1½d.	" " half-a-crown
(11)	"	⅔ of £2. 10	" " £5
(12)	"	⅝ of £11. 6	" " £11
(13)	"	⅔ of £1. 1	" " £1
(14)	"	⅔ of 13s. 4d.	" " £2
(15)	"	⅔ of £5	" " £5. 17. 6
(16)	"	⅔ of £7. 10	" " £1. 2. 6
(17)	"	⅔ of £6. 13. 6	" " £9
(18)	"	⅔ of £1. 7. 6	" " £4. 4. 6
(19)	"	⅔ of £4. 18	" " 7 guineas
(20)	"	⅔ of £7. 0. 6	" " £10. 9. 0
(21)	"	⅔ of £2. 2. 9	" " £3
(22)	"	1½ ac.	" " 17 poles
(23)	"	11¾ sq. yds.	" " 1 sq. pole
(24)	"	15 grains	" " 1 lb. Troy

(25)	Reduce	$1\frac{1}{4}$ lb. Troy	to the fraction of 1 lb. Avoir.
(26)	"	$3\frac{1}{4}$ sq. yds.	" " a sq. pole
(27)	"	$8\frac{1}{4}$ dwts.	" " $1\frac{1}{3}$ lbs. Avoir.
(28)	"	$\frac{5}{9}$ of 3 tons	" " 17 cwt.
(29)	"	$\frac{7}{11}$ of 1 ton 5 cwt.	" " $1\frac{1}{2}$ tons
(30)	"	$3\frac{3}{11}$ of 3 qrs. 5 lbs.	" " 2 tons 11 cwt.
(31)	"	$5\frac{2}{3}$ of 11 lbs. 8 oz.	" " 1 qr.
(32)	"	$9\frac{1}{10}$ of 5 tons 3 qrs.	" " 13 tons 10 cwt.
(33)	"	$2\frac{1}{3}$ of 3 ft. 8 in.	" " 1 yard
(34)	"	$9\frac{1}{8}$ of 7 ft. 9 in.	" " 4 ft. 7 in.
(35)	"	$3\frac{2}{7}$ of 11 yds. 2 ft.	" " 1 pole
(36)	"	$1\frac{3}{4}$ of 2 gals.	" " 36 gals.
(37)	"	$9\frac{3}{5}$ of 1 cub. yd.	" " $5\frac{1}{2}$ cub. yds.
(38)	"	$11\frac{1}{10}$ of 3 yds. 3 qrs. 1 n.	" " 12 yards
(39)	"	$9\frac{2}{3}$ of 11 h. 30 m.	" " a day
(40)	"	$\frac{1}{8}$ of $2\frac{1}{2}$ days	" " 35 h. 45 m.
(41)	"	$\frac{1}{11}$ of $1\frac{3}{4}$ miles	" " 10 miles
(42)	"	$\frac{2}{3}$ of $\frac{3}{4}$ of 1 m. 5 fur.	" " a mile
(43)	"	$\frac{7}{9}$ of 3 ac. 3 r.	" " 20 acres
(44)	"	$1\frac{6}{7}$ of 9 ac. 1 r. 20 p.	" " $3\frac{1}{2}$ acres
(45)	"	$6\frac{1}{3}$ of 3 lbs. 8 dwts.	" " 34 lbs. Troy
(46)	"	$3\frac{1}{8}$ of 5 lbs. 10 oz. Troy	" " 38 lbs. Avoir.
(47)	"	$1\frac{2}{9}$ of 17 tons 1 cwt.	" " 30 tons
(48)	"	$7\frac{4}{9}$ of 31 dys. 12 hrs.	" " $365\frac{1}{4}$ days
(49)	"	$1\frac{1}{2}$ of £2. 12. 6	" " £5
(50)	"	$5\frac{5}{8}$ of $3\frac{1}{4}$ guineas	" " 112 half-crowns

## Ex. XV.

- (1) Find the sum of  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{5}$  and  $\frac{1}{6}$ .
- (2) From  $\frac{1}{2}$  of  $\frac{2}{3}$  of  $\frac{3}{4}$  take  $\frac{1}{5}$  of  $\frac{5}{6}$ .
- (3) Multiply the sum of  $\frac{1}{4}$  and  $\frac{1}{5}$  by their difference.
- (4) By how much is  $1\frac{2}{3}$  of 15 greater than  $14\frac{1}{2} \times 1\frac{1}{2}$ .
- (5) Divide £9. 12. 6 by  $3\frac{1}{3}$ .
- (6) Find the sum of  $\frac{1}{4}$  guineas +  $\frac{1}{4}$  £ +  $\frac{1}{4}$  shilling.

- (7) Reduce  $\pounds 14\frac{39}{100}$  to account money.
- (8) Divide the sum of  $1\frac{2}{3}$  and  $\frac{5}{8}$  by the product of their sum and difference.
- (9) What number multiplied by  $\frac{3}{5}$  of  $11\frac{1}{2}$  will give 20?
- (10) Find the value of  $\frac{7}{8}$  yard +  $\frac{5}{8}$  foot +  $\frac{1}{8}$  in.
- (11) A clock gains  $\frac{1}{3}$  of  $3\frac{1}{2}$  minutes in 2 hours 30 min., what will it gain in 8 days 8 hours?
- (12) A field of 100 acres is divided into three equal parts, what is the exact area of each?
- (13) The shares of a company rise  $\pounds 1\frac{5}{8}$ , what is the increase in the value of 109 shares?
- (14) Reduce  $\frac{1}{4}$  of 3 guineas to the fr. of  $\pounds 10$ .
- (15) If a person pays  $\frac{1}{4}$  of his income for rent and  $\frac{2}{9}$  for rates and taxes and these two sums amount to  $\pounds 17$ , what is his income?
- (16) A plot of ground measuring 3 ac. 0 r. 24 p. was sold for building purposes in the following lots, viz.  $\frac{2}{7}$  of the whole at  $3\frac{1}{2}d.$  per sq. yard,  $\frac{2}{3}$  at  $9d.$ ,  $\frac{2}{3}$  at  $1s.$   $0\frac{1}{2}d.$  and the remainder at  $1s.$   $2d.$  What was the total amount realised?
- (17) From  $\pounds 20.$   $0.$   $2\frac{1}{4}$  take  $\pounds 11.$   $0.$   $6\frac{3}{4}$ .
- (18) From  $\frac{2}{3}$  of two guineas take  $\frac{5}{8}$  of  $13s.$   $4d.$
- (19) What is the value of  $\frac{2}{3}$  of  $\frac{3}{4}$  of  $\pounds 7.$   $10.$   $0$ ?
- (20) What number added to the sum of  $\frac{3}{8}$ ,  $\frac{1}{8}$ ,  $\frac{5}{8}$  and  $1\frac{1}{2}$  will make 5?
- (21) From a plank measuring 19 ft. 6 in. there is cut away  $2\frac{1}{3}$  of  $\frac{3}{4}$  of the whole. What length remains?
- (22) Express  $\frac{2}{3}$  of  $\pounds 1.$   $5.$   $0$  as a fr. of  $\pounds 9.$   $6.$   $8$ .
- (23) Reduce  $\frac{1}{3}\frac{5}{6}\frac{21}{49}$  to its lowest terms.
- (24) Divide 1 by  $\frac{4}{9}$  of  $1\frac{3}{4}$ .
- (25) From  $\pounds 2.$   $0.$   $6\frac{1}{4}$  take  $\pounds 1.$   $11.$   $10\frac{1}{4}$ .
- (26) Divide the product of  $\frac{3}{4}$  and  $\frac{3}{10}$  by half the sum of  $1\frac{1}{4}$  and  $\frac{3}{4}$ .
- (27) How many times is  $\frac{3}{4}$  of 30 poles contained in  $\frac{5}{8}$  of  $11\frac{1}{4}$  acres?
- (28) If  $\frac{3}{4}$  of  $\frac{5}{6}$  of a yard cost  $3\frac{3}{4}s.$ , what is that for 10 yards?

(29) Out of a total force of 48000 troops  $\frac{3}{4}$  of the number were on the sick list and  $\frac{1}{3}$  of the remainder were non-effective. How many combatants could be mustered?

(30) If  $\frac{1}{4}$  lb. butter cost  $3\frac{1}{8}$ d., what is the cost of 11 cwt. 3 qrs.?

(31) Express 1 cwt. 2 qrs. as the fraction of 1 ton 19 cwt.

(32) A hhd. of ale cost £4. 1. 0; what is the price of the sixth part of three-fourths of a gallon?

(33) Divide  $\frac{1}{11}$  of  $\frac{5}{9}$  of 13 by the sum of  $\frac{1}{2}$ ,  $\frac{1}{3}$  and  $\frac{1}{4}$ .

(34) A merchant sold  $\frac{1}{2}$  his stock for  $\frac{3}{4}$  of the entire cost price,  $\frac{1}{2}$  the remainder at a gain of £40,  $\frac{1}{4}$  of what still remained for its cost price £75, and the rest at a reduction of  $\frac{2}{3}$  on the cost price. What was his total gain or loss?

(35) What amount would a rate  $1\frac{5}{8}$ d. in the £ produce on an assessment of £560016?

(36) Reduce to its simplest form

$$\left(\frac{1\frac{1}{2}}{2} - \frac{1\frac{1}{2}}{3}\right) - \left(\frac{1\frac{1}{2}}{4} - \frac{1\frac{1}{2}}{5}\right).$$

(37) Reduce £2. 11. 10 to the fr. of 15 half-crowns.

(38) Find the value of  $\frac{1}{2}$  of  $\frac{5}{9}$  of a shilling +  $\frac{2}{3}$  of  $\frac{3}{4}$  of £ $\frac{5}{8}$  -  $\frac{1}{7}$  of 5 half-guineas.

(39) What will  $1\frac{3}{4}$  of a dozen +  $1\frac{9}{11}$  of 3 score cost at £1. 8. 0 each?

(40) Divide a guinea between A and B, giving the former 1s. more than  $\frac{1}{2}$  as much again as the latter.

(41) Divide  $3\frac{1}{2} \times 11\frac{1}{3} \times \frac{5}{8}$  by  $9\frac{1}{4} \times \frac{3}{5}$ .

(42) Reduce  $\frac{1}{8}\frac{1}{5}\frac{1}{3}\frac{1}{7}$  to its lowest terms.

(43) Reduce  $2\frac{2}{3}$  of  $\frac{5}{8}$  of a lb. Troy to the fraction of 1 lb. Avoirdupois.

(44) Simplify

$$\frac{\frac{1}{2} + \frac{1}{3} + \frac{1}{4}}{13 - \left(\frac{1}{2} + \frac{1}{4}\right)} + \frac{11\frac{1}{2}}{4 - \frac{2}{1\frac{3}{4}}} \text{ of } \frac{9\frac{1}{2}}{3\frac{1}{8}} \text{ of } \frac{10}{11\frac{1}{2}}.$$

(45) Express 4 m. 2 fur. 15 p. 3 yards as a fr. of  $1\frac{3}{8}$  miles.

(46) If  $\frac{1}{12}$  share in a company cost £19. 10. 6, what shares will £293. 12. 0 buy?

(47) A booking clerk receives altogether £19. 8.  $8\frac{1}{2}$  as third class fare from Darlington to London. How many full fares does this represent if he receives £3. 11.  $7\frac{1}{4}$  for two whole and three half tickets?

(48) Three persons received respectively the fifth, sixth, and eighth parts of the fourth of £25. What sum remained of the £25?

(49) Add together  $\frac{1}{8}$  of a bushel,  $\frac{3}{4}$  of a peck,  $\frac{1}{4}$  of 3 quarters, and  $\frac{1}{7}$  of 7 bus. 3 pks. 1 gal.

(50) Three towns *A*, *B* and *C* are situated in a straight line. The distance from *A* to *C* is  $9\frac{1}{2}$  miles, and *B* is  $\frac{1}{15}$  of this distance nearer *A* than to *C*. What is the distance from *B* to *C*?

(51) An exposed sheet of water loses  $\frac{1}{10}$  of its volume by evaporation daily. If it contains 190,000 gallons, how much would be lost in five days?

(52) From 3 tons 10 cwt. 1 qr. take 1 ton 11 cwt. 5 lbs., and reduce the remainder to the fraction of a ton.

(53) If a man earns  $\frac{1}{4}$  as much as 7 women, and a boy  $\frac{1}{2}$  of  $\frac{3}{8}$  of the wages of 2 women, what part of a man's wages does a boy earn?

(54) Reduce  $\frac{1}{10}$  of  $9\frac{3}{4}$  acres to the fr. of 1 ac. 13 p.

(55) Add together  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{5}$ ,  $\frac{1}{7}$ ,  $\frac{1}{11}$ , and divide the result by  $3\frac{4}{5}$ .

(56) By selling an article at £1. 8. 0 I gain on 100 the cost price of a dozen. What was the cost price of  $\frac{5}{8}$  of  $3\frac{1}{2}$  of a dozen?

(57) Which is the greater, and by how much,  $\frac{11\frac{1}{4}}{11\frac{3}{4}}$ , or  $5 \times \frac{1}{3}$  of  $7\frac{1}{3}$ ?

(58) Reduce to its simplest form

$$\frac{1\frac{1}{2} + \frac{2}{3} \text{ of } \frac{5}{8}}{9\frac{1}{4} \text{ of } \frac{2}{3}} \text{ of } \frac{11\frac{1}{4} \text{ of } \frac{1}{2} \text{ of } 2\frac{1}{4}}{14\frac{3}{4} \text{ of } 3\frac{1}{2} + \frac{1}{2\frac{1}{2}}} \text{ of } \frac{11 - \frac{2}{7\frac{1}{4}}}{5\frac{1}{8} \text{ of } \frac{1}{3\frac{1}{4}}}.$$

(59) Reduce the sum of a guinea, a half-guinea, a crown, a half-crown, and sevenpence to the fr. of  $3\frac{1}{2}$  guineas.

(60) Multiply £2. 0. 11 by  $13\frac{1}{2}\frac{3}{4}$ .

(61) What fraction divided by  $9\frac{1}{4}$  will give  $41\frac{1}{2}$ ?

(62) Divide the sum of the sum, difference, and product of 9 and  $\frac{9}{10}$  by the quotient obtained on dividing the former by the latter.

(63) If a rise of  $\frac{1}{3}d.$  per lb. in the price of cotton caused an increase of £100 in the receipts, how many bales each 640 lbs. were sold?

(64) If  $\frac{3}{4}$  of  $\frac{2}{3}$  of a meadow measures 3 ac. 0 r.  $11\frac{1}{2}$  p., what will  $\frac{1}{19}$  of the remainder measure?

(65) If  $\frac{1}{7}$  of 10000 bricks are required for a piece of work,  $\frac{1}{3}$  of the same number for another,  $\frac{2}{11}$  for another, and  $\frac{7}{31}$  for another, how many are required altogether?

(66) If  $\frac{1}{3}$  of 1 lb. sugar cost as much as  $\frac{1}{4}$  lb. rice and  $2\frac{1}{2}$  lb. rice cost 5d., what is the price of sugar per lb.?

(67) A wheel makes 72 revolutions a minute; if its speed were increased  $\frac{1}{15}$  how many revolutions would it make in 6 working days of 10 hrs. each?

(68) Express 2 nls.  $1\frac{1}{4}$  in. as the fr. of a yard.

(69) The inner circle formed by the felloes of a cart wheel is 13 ft. 6 in. round; at what distance apart should the marks for the centre of each of the ten spokes be placed?

(70) A cubic foot of water weighs  $62\frac{1}{2}$  lbs.; what weight of water is contained in an oblong bath 36 ft. long  $12\frac{1}{4}$  ft. broad and 5 ft.  $4\frac{1}{2}$  inches deep?

(71) At an election the successful candidate polled  $\frac{1}{3}$  more votes than the other. The number of voters was 11543. How many votes had each candidate?

(72) If the number of persons in receipt of relief in London was 76860 in the year 1877, and had decreased  $\frac{1}{10}$  from the year 1876, which in its turn had shewn a decrease of  $\frac{1}{15}$  on 1875, what was the average number for the three years?

(73) A person going on a journey travels  $\frac{1}{7}$  the distance on the first day,  $\frac{2}{15}$  of the remainder on the second,  $\frac{3}{11}$  of what still remains on the third, and the remaining 48 miles on the fourth day. How many miles did he travel?

(74) How many lbs. Troy are contained in 2 tons  $11\frac{3}{4}$  cwt.?

(75) Multiply 3 ac. 2 r.  $11\frac{1}{4}$  p. by  $26\frac{3}{4}$ .

(76) Express 19 gallons  $3\frac{1}{2}$  pints as a fr. of  $11\frac{1}{4}$  barrels, each 36 gallons.

(77) How many sixteenths of an inch are there in  $1\frac{1}{4}$  yards?

(78) A barrel of petroleum containing 60 gallons loses  $\frac{1}{11}$  of its contents by evaporation,  $\frac{9}{10}$  of the remainder is sold at 4*d.* per quart, i.e.  $\frac{8}{9}$  of its cost price per quart. The remainder is sold at 2*d.* per quart. What was the entire gain?

(79) Simplify

$$\frac{1}{\frac{1}{2} \text{ of } 2\frac{1}{4} - \frac{1}{3}} \text{ of } \frac{2}{1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4}}.$$

(80) Express  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{4}{5}$ ,  $\frac{2}{6}$ ,  $\frac{5}{11}$  as fractions with the same denominator.

(81) How many times is  $\frac{1}{3}$  of an inch contained in  $\frac{4}{11}$  of a quarter of a mile?

(82) Reduce  $1\frac{3}{8}$  of  $\frac{9}{22}$  of 3*s.* to the fr. of £1. 7. 0.

(83) From £1. 9.  $10\frac{1}{2}$  take 13*s.*  $6\frac{3}{4}$ *d.* and divide the remainder by  $3\frac{1}{2}$ .

(84) On four successive days the barometer stood at  $29\frac{1}{10}$ , on the next day at  $30\frac{3}{100}$ , the following day at  $30\frac{17}{100}$ , and on the next at 31 inches. What was the weekly average?

(85) How many strips of paper  $20\frac{1}{2}$  inches wide will be required in papering the walls of a room 15 ft.  $4\frac{1}{2}$  in. long and 10 ft. 3 in. broad?

(86) Add together £2. 1.  $9\frac{3}{8}$ , £4. 11.  $0\frac{3}{10}$ , £3. 16.  $2\frac{7}{8}$ , £1. 7.  $6\frac{2}{3}$ , £11. 16.  $3\frac{1}{4}$ , £1. 8.  $0\frac{1}{2}$ .

(87) Divide the third part of £2. 12. 6 by  $\frac{1}{12}$  of  $\frac{2}{7}$  of 5.

(88) What is the value of  $11\frac{1}{8}$  yards of flannel at  $2\frac{1}{4}$ *s.* per yard?

(89) Reduce to its simplest form

$$\left( \frac{2\frac{1}{3} \text{ of } \frac{4}{33} \text{ of } 14\frac{1}{7}}{\frac{5}{23} \times 7\frac{2}{7} \text{ of } 1\frac{8}{5}} \text{ of } \frac{1\frac{1}{4}}{7} \right) \div \frac{7\frac{2}{11}}{1 - \frac{2}{3} \text{ of } \frac{1}{2}}.$$

(90) From 3 times  $\frac{1}{11}$  of £11  $\frac{1}{10}$  take £2. 15.  $4\frac{1}{2}$ .

(91) If mercury be  $13\frac{598}{1000}$  times as heavy as water, and a cubic foot of water weighs 1000 oz. Avoirdupois, what will be the weight of a cubic yard of mercury?



(92) How many rafters  $2\frac{1}{2}$  in. by  $3\frac{1}{2}$  in. and 18 ft. long could be cut from a block of wood 12 yards long, 3 ft.  $2\frac{1}{2}$  in. broad and 1 ft.  $5\frac{1}{2}$  in. thick?

(93) From  $\frac{2}{3}$  of  $\frac{7}{8}$  of 4 take  $\frac{1}{8}$  of  $\frac{6}{11}$  of 5.

(94) What sum of money is that if after the  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{1}{14}$  and  $\frac{1}{15}$  parts are given away there remains 15s.?

(95) A certain number divided by  $2\frac{3}{4}$  gives  $\frac{6}{11}$  as quotient; what would have been the product had it been multiplied by  $2\frac{3}{4}$ ?

(96) Find the cost of  $103\frac{1}{4}$  cwt. of sugar at 3s.  $9\frac{1}{2}$ d. per stone.

(97) *A* has £ $101\frac{1}{8}$  and *B* £ $71\frac{1}{4}$ . *A* pays to *B*  $\frac{2}{7}$  of  $5\frac{1}{2}$  of £1. 10. 0 and *B* pays to *A*  $\frac{3}{11}$  of  $\frac{5}{8}$  of £10. How much has *A* now more than *B*?

(98) Find the solid content of a block of stone 25 in. long by  $19\frac{3}{4}$  in. broad and  $3\frac{3}{8}$  in. thick.

(99) Find the cost of  $11\frac{1}{2}$  pieces of ribbon each  $19\frac{5}{8}$  yards long at  $11\frac{3}{4}$ d. per yard.

(100) Reduce  $4^{\circ} 33' 45''$  to the fraction of  $73^{\circ}$ .

## DECIMAL FRACTIONS.

Ex. I.

Express as Decimals :—

- (1)  $\frac{3}{10}, \frac{3}{100}, \frac{3}{1000}$
- (2)  $\frac{7}{100}, \frac{7}{10000}, \frac{7}{1000}$
- (3)  $\frac{9}{10}, \frac{7}{100}, \frac{1}{1000}$
- (4)  $\frac{111}{10}, \frac{9}{100}, \frac{1071}{10000}$
- (5)  $\frac{107}{1000}, \frac{9}{10}, \frac{11}{100}, \frac{1569}{100000}$
- (6)  $\frac{71}{10000}, \frac{81496}{1000000}, \frac{31}{1000000}$
- (7)  $\frac{1}{10} + \frac{6}{10} + \frac{7}{10}$
- (8)  $\frac{9}{10} + \frac{9}{100} + \frac{87}{1000}$
- (9)  $\frac{103}{1000} + \frac{31}{100} + \frac{19}{100000} + \frac{17}{10000}$
- (10) 3 tenths + 7 millionths + 51 thousandths
- (11) 61 tenths + 15 hundredths + 13 ten-thousandths
- (12) 7 hundredths + 11 millionths + 113 hundred-thousandths
- (13) 51 millionths + 51 hundredths + 51 tenths
- (14) 1001 thousandths + 101 hundredths + 11 tenths
- (15) 516 hundredths + 19 millionths + 5 thousandths
- (16) 33 millionths + 33 thousandths + 33 ten-thousandths
- (17) 301 hundred-thousandths + 31 tenths + 3 ten-thousandths
- (18) 562 millionths + 726 tenths + 7296 thousandths
- (19) 15 hundredths + 12 hundred thousandths + 19 millionths
- (20) 92 tenths + 37 millionths + 87 thousandths
- (21) 111 tenths - 111 thousandths
- (22) 37 thousandths - 37 millionths
- (23) 5 hundred-thousandths - 18 millionths
- (24) 311 thousands + 151 tenths - 967 hundredths

- (25) 60 tenths + 11 ten-thousandths - 819 millionths  
 (26) 476 millionths - 476 ten-millionths  
 (27) 13 hundredths + 5 tenths - 71 ten-thousandths  
 (28) 86 thousandths + 86 ten-millionths - 171 ten-thousandths  
 (29) 11 tenths + 11 thousandths + 11 millionths - 11 hundredths  
 (30) 37 ten-thousandths + 37 hundred-thousandths - 37 millionths

## Ex. II.

Express as Vulgar Fractions :--

- (1)  $\cdot 5, \cdot 05, \cdot 0005$   
 (2)  $\cdot 8, \cdot 81, \cdot 0081$   
 (3)  $\cdot 3, \cdot 003, \cdot 00003$   
 (4)  $\cdot 315, \cdot 5170, \cdot 86$   
 (5)  $\cdot 095, \cdot 0715, \cdot 02134$   
 (6)  $\cdot 514, \cdot 8136, \cdot 446$   
 (7)  $\cdot 00758, \cdot 02131, \cdot 061376$   
 (8)  $\cdot 221958, \cdot 6903, \cdot 08157$   
 (9)  $3\cdot 303, 33\cdot 03, \cdot 3303$   
 (10)  $\cdot 03031, 71\cdot 061, \cdot 00015$   
 (11)  $3\cdot 14, 8\cdot 219, 5\cdot 101$   
 (12)  $7\cdot 003, \cdot 07003, 70\cdot 03$   
 (13)  $5\cdot 1832, \cdot 2015, \cdot 000175$   
 (14)  $4\cdot 3103, 431\cdot 03, \cdot 043103$   
 (15)  $82\cdot 7, 590\cdot 006, 5\cdot 90006$   
 (16)  $36\cdot 07, 750\cdot 13, 8\cdot 0075$   
 (17)  $\cdot 021, 1\cdot 02, \cdot 00025$   
 (18)  $\cdot 713, 5\cdot 1903, 21\cdot 007$   
 (19)  $4\cdot 4041, 440\cdot 41, \cdot 0041$   
 (20)  $3\cdot 287516, \cdot 503, \cdot 030071$

## Ex. III.

Find the value of :—

- (1)  $2\cdot 4 + 3\cdot 14 + 3\cdot 6 + 9\cdot 12 + 8\cdot 04$   
 (2)  $\cdot 123 + \cdot 247 + \cdot 316 + \cdot 92 + \cdot 58$   
 (3)  $\cdot 7163 + \cdot 951 + \cdot 216 + \cdot 035 + \cdot 6926$   
 (4)  $51\cdot 7 + 7\cdot 8 + 5\cdot 936 + 72\cdot 31 + 61\cdot 3$

- (5)  $92\cdot18 + 76\cdot95 + 576\cdot03 + 596\cdot37 + \cdot031$
- (6)  $1\cdot03 + 5\cdot007 + \cdot051 + \cdot0175 + \cdot256$
- (7)  $5\cdot071 + 371\cdot51 + \cdot0013 + \cdot015 + 2\cdot0158$
- (8)  $7\cdot0021 + 15\cdot376 + \cdot00195 + 7\cdot308 + 3\cdot1032$
- (9)  $\cdot0313 + 32\cdot156 + \cdot0212 + 7\cdot308 + 7\cdot39 + 73\cdot9$
- (10)  $58\cdot205 + \cdot00157 + 20\cdot031 + 7\cdot595 + \cdot03176$
- (11)  $73\cdot295 + \cdot3103 + 1\cdot0021 + 5\cdot906 + \cdot0713$
- (12)  $8\cdot21 + 38\cdot017 + \cdot2906 + 1\cdot509 + 11\cdot81$
- (13)  $5\cdot01736 + 9\cdot6 + 1\cdot9682 + \cdot0007 + 3\cdot3$
- (14)  $99\cdot517 + 38\cdot6984 + 119\cdot5 + 38 + \cdot0117$
- (15)  $1\cdot101 + 11\cdot01 + \cdot1101 + \cdot07876 + \cdot995$
- (16)  $3\cdot704 + 9981\cdot17 + 92\cdot367 + \cdot01599 + \cdot04$
- (17)  $156\cdot9 + 96\cdot51 + 78\cdot901 + 13\cdot22 + 17\cdot584$
- (18)  $97\cdot316 + 1597\cdot308 + 316\cdot2917 + \cdot03 + 159\cdot1$
- (19)  $76\cdot038 + 11\cdot215 + 68\cdot207 + 56 + 37\cdot013 + 96\cdot12$
- (20)  $107\cdot0131 + 96\cdot317 + \cdot017 + 776\cdot9 + 15\cdot61$
- (21)  $1596\cdot131 + 702\cdot021 + \cdot170038 + 319\cdot7 + 5\cdot93$
- (22)  $3814\cdot04 + 243\cdot123 + \cdot013 + 66\cdot665 + 31\cdot581$
- (23)  $58\cdot234 + 69\cdot3157 + \cdot071007 + 59\cdot1361 + 21\cdot5$
- (24)  $49\cdot016 + \cdot0213 + 31\cdot21 + 44\cdot5609 + 38\cdot45 + 60\cdot12$
- (25)  $30\cdot017 + 2916\cdot01 + 73\cdot037 + 381\cdot69 + \cdot017$
- (26)  $11\cdot176 + 9\cdot609 + 38\cdot71 + 59\cdot687 + 1\cdot031 + \cdot19$
- (27)  $573\cdot162 + 83\cdot017 + 92\cdot159 + 30\cdot031 + 99\cdot999$
- (28)  $55\cdot7 + 31\cdot69 + 83\cdot15 + 95\cdot142 + 316\cdot208$
- (29)  $29\cdot5 + 83\cdot79 + \cdot0915 + 7\cdot7161 + 51\cdot906$
- (30)  $11\cdot154 + 32\cdot323 + 45\cdot44 + 36\cdot91 + 576\cdot28$
- (31)  $705\cdot75 + 31\cdot021 + 69\cdot02 + 76\cdot3 + \cdot028$
- (32)  $17\cdot177 + 426 + 37\cdot81 + \cdot219 + \cdot03101$
- (33)  $8321\cdot9 + 537\cdot08 + 68\cdot005 + 13\cdot716 + 92\cdot37$
- (34)  $188\cdot219 + 514\cdot0312 + 3\cdot806 + 299\cdot04$
- (35)  $57\cdot063 + 219\cdot6093 + 5\cdot961 + 3\cdot215 + 8\cdot64$
- (36)  $\cdot013 + \cdot179 + \cdot96703 + \cdot5967 + \cdot7968 + \cdot38$
- (37)  $\cdot2915 + \cdot6813 + 6\cdot354 + \cdot0026 + \cdot79381$
- (38)  $1159\cdot217 + 387\cdot61 + 71\cdot316 + 91\cdot204 + 74\cdot031$
- (39)  $8613\cdot96 + 69\cdot6 + 71\cdot58 + \cdot021 + 73\cdot0074$
- (40)  $440\cdot46 + 96\cdot87 + 596\cdot38 + 71\cdot96 + 69\cdot1$

## Ex. IV.

(1)	$\cdot 356 - \cdot 298$	(26)	$\cdot 03107 - \cdot 00071961$
(2)	$\cdot 57031 - \cdot 3806$	(27)	$5\cdot 71021 - 2\cdot 369684$
(3)	$19\cdot 210 - 7\cdot 998$	(28)	$1\cdot 29613 - \cdot 672163$
(4)	$56\cdot 036 - 3\cdot 4796$	(29)	$\cdot 71031 - \cdot 314696$
(5)	$83\cdot 5102 - 27\cdot 847$	(30)	$1\cdot 11315 - \cdot 5968$
(6)	$5\cdot 7031 - 3\cdot 29164$	(31)	$10 - 8\cdot 20571$
(7)	$80\cdot 2150 - \cdot 37815$	(32)	$36\cdot 36 - 32\cdot 3156$
(8)	$21\cdot 012 - 7\cdot 31569$	(33)	$19\cdot 271 - 5\cdot 96913$
(9)	$17\cdot 369 - 5\cdot 446$	(34)	$8\cdot 264 - 6\cdot 03176$
(10)	$1\cdot 026103 - \cdot 21968$	(35)	$15\cdot 903 - 4\cdot 696843$
(11)	$51\cdot 0316 - 32\cdot 7147$	(36)	$1003\cdot 713 - 513\cdot 71314$
(12)	$23 - 19\cdot 6976$	(37)	$\cdot 30216 - \cdot 296167$
(13)	$70\cdot 151 - 15\cdot 8261$	(38)	$5\cdot 9013 - \cdot 696837$
(14)	$32\cdot 961 - 30\cdot 2169$	(39)	$\cdot 6931 - \cdot 021396$
(15)	$\cdot 13096 - \cdot 013096$	(40)	$7\cdot 2183 - 5\cdot 4145$
(16)	$736 - 57\cdot 829$	(41)	$1 - \cdot 007136$
(17)	$83\cdot 6 - 83\cdot 47916$	(42)	$12 - \cdot 517$
(18)	$5\cdot 89 - \cdot 02976$	(43)	$1500\cdot 5 - 714\cdot 286$
(19)	$1 - \cdot 00313$	(44)	$7 - 6\cdot 90086$
(20)	$\cdot 73 - \cdot 510317$	(45)	$70\cdot 107 - 69\cdot 89706$
(21)	$105 - 96\cdot 335$	(46)	$3001 - 597\cdot 31$
(22)	$63 - 15\cdot 0191$	(47)	$15 - 6\cdot 8461$
(23)	$20\cdot 1 - 20\cdot 00317$	(48)	$70\cdot 201 - 38\cdot 57$
(24)	$276 - 3\cdot 7173$	(49)	$136\cdot 159 - 136\cdot 0159$
(25)	$13 - 5\cdot 90516$	(50)	$1 - \cdot 996079$

## Ex. V.

- |                             |  |
|-----------------------------|--|
| (1) $5.5 \times 3.2$        | (26) $.2 \times 3.4 \times .5$                   |
| (2) $7.91 \times 8.6$       | (27) $3.8 \times .07 \times .02$                 |
| (3) $3.25 \times 4.5$       | (28) $11.01 \times 110 \times .1102$             |
| (4) $2.25 \times 1.16$      | (29) $.3 \times .033 \times 33.5$                |
| (5) $9.07 \times .38$       | (30) $29.58 \times 7.3 \times .072$              |
| (6) $.05 \times .05$        | (31) $11.56 \times .021 \times .386$             |
| (7) $.26 \times .26$        | (32) $276.5 \times .35 \times .08$               |
| (8) $.3025 \times .5$       | (33) $517 \times 517 \times .000517$             |
| (9) $8.21 \times 10$        | (34) $28.91 \times .2891 \times 2.891$           |
| (10) $5.319 \times 1.01$    | (35) $.03 \times .07 \times 7.007$               |
| (11) $336.8 \times 7.25$    | (36) $.71 \times 31.5 \times .0024$              |
| (12) $.0441 \times .04$     | (37) $4.44 \times .044 \times 54.4$              |
| (13) $56.802 \times 1.09$   | (38) $312.21 \times 11.63 \times .071$           |
| (14) $19.21 \times 3.65$    | (39) $119.5 \times .036 \times 1.21$             |
| (15) $.0587 \times 2.11$    | (40) $.47 \times .47 \times 47$                  |
| (16) $3.102 \times 31.02$   | (41) $200 \times 3.41 \times .023$               |
| (17) $.56801 \times 3000$   | (42) $3.05 \times 29.5 \times .00048$            |
| (18) $190.901 \times 1.9$   | (43) $2 \times .22 \times 1.3085$                |
| (19) $.0021 \times .07$     | (44) $.5 \times .08 \times .931 \times .095$     |
| (20) $36.2185 \times .229$  | (45) $1.02 \times 102 \times 10.2 \times .102$   |
| (21) $.115 \times .7269$    | (46) $3600 \times .36 \times 3.6 \times .03$     |
| (22) $3.5804 \times .0358$  | (47) $.006 \times .55 \times 25 \times .83$      |
| (23) $.0631 \times .00028$  | (48) $.002 \times .071 \times .00038$            |
| (24) $90.157 \times 9015$   | (49) $5.107 \times .05107 \times .05 \times 700$ |
| (25) $338.022 \times .0076$ | (50) $3.8 \times 38000 \times .0025$             |

## Ex. VI.

(1)	$\cdot 36288 \div 2$	(26)	$5 \div \cdot 5$
(2)	„ $\div 3$	(27)	$1\cdot 7 \div \cdot 5$
(3)	„ $\div 4$	(28)	$38\cdot 67 \div 10$
(4)	„ $\div 5$	(29)	$11\cdot 564 \div 1000$
(5)	„ $\div 6$	(30)	$2\cdot 25 \div 100$
(6)	„ $\div 7$	(31)	$\cdot 276 \div 10000$
(7)	„ $\div 8$	(32)	$11\cdot 564 \div \cdot 38$
(8)	„ $\div 9$	(33)	$2\cdot 25 \div \cdot 015$
(9)	$36\cdot 288 \div \cdot 2$	(34)	$3\cdot 62 \div 8$
(10)	„ $\div \cdot 3$	(35)	$92\cdot 007 \div \cdot 09$
(11)	„ $\div \cdot 4$	(36)	$5\cdot 635 \div \cdot 63$
(12)	„ $\div \cdot 5$	(37)	$8 \div \cdot 0064$
(13)	„ $\div \cdot 6$	(38)	$7\cdot 15 \div 31\cdot 55$
(14)	„ $\div \cdot 7$	(39)	$\cdot 06286 \div 73\cdot 9$
(15)	„ $\div \cdot 8$	(40)	$11\cdot 002 \div \cdot 0032$
(16)	„ $\div \cdot 9$	(41)	$5960\cdot 31 \div \cdot 2864$
(17)	$3\cdot 6288 \div \cdot 02$	(42)	$1 \div \cdot 0075$
(18)	„ $\div \cdot 03$	(43)	$31\cdot 05 \div \cdot 314$
(19)	„ $\div \cdot 04$	(44)	$\cdot 002715 \div 655$
(20)	„ $\div \cdot 05$	(45)	$8\cdot 001837 \div 900$
(21)	„ $\div \cdot 006$	(46)	$302 \div 14\cdot 215$
(22)	„ $\div \cdot 007$	(47)	$6 \div \cdot 000715$
(23)	„ $\div \cdot 08$	(48)	$130\cdot 2 \div 2\cdot 5$
(24)	„ $\div \cdot 9$	(49)	$81\cdot 61 \div 7\cdot 96$
(25)	„ $\div \cdot 009$	(50)	$100\cdot 13 \div 4\cdot 75$

## Ex. VII.

Reduce to Decimals :—

- |   |  |
|---|--|
| (1) $\frac{8}{15}, \frac{9}{12}$                                  | (23) $1\frac{1}{2}$ of $\frac{3}{4}$ of $1\frac{1}{2}$                 |
| (2) $\frac{5}{16}, \frac{11}{40}$                                 | (24) $1\frac{9}{10}$ of $\frac{5}{8}$ of 4                             |
| (3) $\frac{3}{4}, \frac{19}{8}$                                   | (25) $\frac{7}{11}$ of $\frac{33}{4}$ of $\frac{17}{8}$                |
| (4) $\frac{7}{25}, \frac{111}{50}$                                | (26) $\frac{5}{14}$ of $\frac{77}{80}$ of 6                            |
| (5) $\frac{3}{5}, \frac{48}{5}$                                   | (27) $13\frac{1}{2}$ of $\frac{7}{8}$ of $1\frac{1}{10}$               |
| (6) $\frac{104}{40}, \frac{31}{4}$                                | (28) $\frac{77}{88}$ of 90   |
| (7) $12\frac{2}{5}, \frac{791}{625}$                              | (29) $1\frac{2}{3}$ of $\frac{9}{7}$ of $1\frac{4}{5}$ of 3            |
| (8) $\frac{80}{250}, \frac{1011}{750}$                            | (30) $10\frac{11}{2}$ of $1\frac{1}{4}$ of 18                          |
| (9) $\frac{59}{84}, \frac{912}{400}$                              | (31) $1\frac{1}{2}$ of $2\frac{1}{2}$ of $3\frac{1}{4}$                |
| (10) $3\frac{7}{2}, 12\frac{1}{50}$                               | (32) $11\frac{9}{7}$ of $\frac{79}{81}$ of 243                         |
| (11) $3\frac{1}{4}, 5\frac{1}{2}$                                 | (33) $2\frac{1}{5}$ of $\frac{5}{8}$ of $\frac{9}{7}$ of 42            |
| (12) $11\frac{5}{8}, 3\frac{7}{5}$                                | (34) $\frac{1}{9}$ of $\frac{1}{10}$ of $\frac{3}{4}$ of $\frac{2}{5}$ |
| (13) $4\frac{11}{2}, 19\frac{7}{8}$                               | (35) $1\frac{8}{10}$ of $\frac{51}{49}$                                |
| (14) $1\frac{1}{2}$ of $2\frac{1}{4}$                             | (36) $\frac{11\frac{1}{2}}{7}$ of $2\frac{1}{4}$                       |
| (15) $\frac{3}{4}$ of $\frac{4}{5}$ of 7                          | (37) $9\frac{1}{2}$ of $\frac{37}{8}$ of $2\frac{3}{4}$                |
| (16) $\frac{1}{2}$ of $\frac{2}{13}$ of $3\frac{1}{4}$            | (38) $7\frac{1}{4}$ of $\frac{5}{8}$ of $1\frac{8}{9}$                 |
| (17) $\frac{71}{12}$ of $2\frac{1}{4}$                            | (39) $1\frac{2}{15}$ of $32\frac{1}{5}$ of $\frac{1}{14}$              |
| (18) $\frac{91}{100}$ of $4\frac{7}{8}$                           | (40) $1\frac{3}{17}$ of $8\frac{5}{8}$ of $\frac{315}{11\frac{1}{2}}$  |
| (19) $6\frac{3}{4}$ of $2\frac{11}{100}$ of 9                     |  |
| (20) $\frac{187}{51200}$ of $\frac{6400}{5120}$ of $3\frac{1}{4}$ |  |
| (21) $12\frac{1}{5}$ of $\frac{5}{8}$                             |  |
| (22) $\frac{2}{5}$ of $2\frac{1}{4}$ of 50                        |  |



## RECURRING DECIMALS.

## EX. VIII.

Reduce to Decimals :—

- |   |   |
|---|---|
| (1) $\frac{1}{3}, \frac{1}{8}, \frac{1}{7}$         | (16) $\frac{31}{9}, \frac{16}{13}$      |
| (2) $\frac{2}{9}, \frac{5}{7}, \frac{3}{8}$         | (17) $\frac{1}{13}, \frac{1}{17}$       |
| (3) $\frac{1}{12}, \frac{100}{180}, \frac{11}{108}$ | (18) $\frac{1}{23}, \frac{1}{27}$       |
| (4) $\frac{7}{11}, \frac{5}{14}, \frac{2}{11}$      | (19) $\frac{4}{31}, 1\frac{2}{27}$      |
| (5) $\frac{13}{18}, \frac{5}{13}, \frac{6}{7}$      | (20) $\frac{9}{111}, 1\frac{3}{13}$     |
| (6) $\frac{4}{3}, \frac{5}{8}, \frac{3}{14}$        | (21) $\frac{102}{101}, \frac{53}{168}$  |
| (7) $\frac{108}{14}, \frac{901}{330}$               | (22) $\frac{11}{28}, \frac{62}{81}$     |
| (8) $\frac{17}{18}, \frac{9}{42}, \frac{8}{12}$     | (23) $\frac{319}{144}, \frac{113}{353}$ |
| (9) $\frac{40}{370}, \frac{512}{117}$               | (24) $\frac{25}{55}, \frac{37}{33}$     |
| (10) $\frac{56}{49}, 1\frac{8}{9}$                  | (25) $\frac{13}{42}, \frac{180}{234}$   |
| (11) $4\frac{1}{30}, 11\frac{5}{140}$               | (26) $\frac{71}{7}, \frac{90}{83}$      |
| (12) $6\frac{4}{70}, 3\frac{17}{21}$                | (27) $\frac{117}{91}, \frac{85}{288}$   |
| (13) $\frac{48}{13}, \frac{6}{11}$                  | (28) $\frac{32}{89}, \frac{95}{57}$     |
| (14) $\frac{80}{6}, \frac{111}{220}$                | (29) $\frac{704}{27}, \frac{821}{99}$   |
| (15) $\frac{36}{37}, \frac{19}{21}$                 | (30) $\frac{512}{706}, \frac{1}{31}$    |

## EX. IX.

Reduce to Vulgar Fractions :—

- |  |  |
|--|--|
| (1) $\cdot\dot{3}, \cdot\dot{0}1\dot{5}$   | (6) $\cdot2\dot{4}, \cdot1\dot{8}$                 |
| (2) $\cdot\dot{2}1, \cdot1\dot{7}$         | (7) $\cdot00\dot{3}\dot{7}, \cdot06\dot{3}$        |
| (3) $\cdot\dot{5}4, \cdot1\dot{6}$         | (8) $\cdot03\dot{0}4, \cdot05\dot{1}$              |
| (4) $\cdot\dot{0}81, 81\dot{9}$            | (9) $\cdot00\dot{3}\dot{6}, \cdot00\dot{3}\dot{6}$ |
| (5) $\cdot4\dot{5}, \cdot00\dot{3}\dot{6}$ | (10) $\cdot81\dot{2}, 4\cdot7\dot{1}$              |

(11) $\cdot 428571, \cdot 031\bar{7}$	(36) $\cdot 51438\bar{2}$
(12) $\cdot 0361, 21\cdot 003$	(37) $\cdot 54308$
(13) $5\cdot 41\bar{6}, 17\cdot 069$	(38) $\cdot 108$
(14) $6\cdot 38\bar{2}, 8\cdot 04\bar{3}$	(39) $\cdot 340\bar{9}$
(15) $17\cdot 31\bar{6}, 2\cdot 00\bar{5}$	(40) $\cdot 762195\bar{1}$
(16) $11\cdot 61\bar{9}, 11\cdot 61\bar{9}$	(41) $3\cdot 031\bar{7}$
(17) $31\cdot 931\bar{8}, 5\cdot 07\bar{6}$	(42) $5\cdot 0031\bar{8}$
(18) $12\cdot 6031\bar{i}, 4\cdot 076\bar{4}$	(43) $1\cdot 0001\bar{7}$
(19) $\cdot 0031\bar{5}, \cdot 0031\bar{5}$	(44) $11\cdot 2021\bar{3}$
(20) $\cdot 0100\bar{i}, \cdot 0100\bar{i}$	(45) $5\cdot 76093\bar{i}$
(21) $3\cdot 261\bar{4}, 7\cdot 081\bar{3}$	(46) $\cdot 003158\bar{6}$
(22) $13\cdot 600\bar{i}, 9\cdot 20\bar{9}$	(47) $\cdot 071428\bar{5}$
(23) $6\cdot 71\bar{4}, 5\cdot 91\bar{6}$	(48) $\cdot 06318\bar{2}$
(24) $5\cdot 63\bar{8}, 6\cdot 940\bar{3}$	(49) $4\cdot 0061\bar{3}$
(25) $3\cdot 303\bar{3}, 3\cdot 303\bar{3}$	(50) $\cdot 56927\bar{4}$
(26) $15\cdot 0432\bar{i}, 51\cdot \bar{9}$	(51) $\cdot 30310\bar{3}$
(27) $16\cdot 031\bar{4}, 8\cdot 277\bar{6}$	(52) $\cdot 0010\bar{7}$
(28) $1\cdot 83\bar{i}, \cdot 0031\bar{4}$	(53) $\cdot 001010\bar{i}$
(29) $\cdot 021\bar{6}, \cdot 021\bar{6}$	(54) $\cdot 001010\bar{i}$
(30) $5\cdot 1\bar{9}, 3\cdot 10\bar{8}$	(55) $\cdot 44642857\bar{1}$
(31) $7\cdot 3\bar{i}, 6\cdot 2\bar{4}$	(56) $\cdot 4735162\bar{9}$
(32) $\cdot 07\bar{6}, 6\cdot 9\bar{2}$	(57) $\cdot 03225806451612\bar{9}$
(33) $\cdot 0042857\bar{i}$	(58) $\cdot 000213\bar{6}$
(34) $\cdot 3175\bar{4}$	(59) $3\cdot 0071428\bar{5}$
(35) $\cdot 07692\bar{3}$	(60) $\cdot 058823529411764\bar{7}$

## Ex. X.

Find the value correct to 5 places of decimals of:--

- (1)  $\cdot 03\bar{6} + 11\cdot 05\bar{8} + 9\cdot 07\bar{i} + \cdot 71428\bar{5}$
- (2)  $\cdot 0037\bar{5} + \cdot 010\bar{6} + \cdot 3214\bar{7} + \cdot 062\bar{5}$
- (3)  $\cdot 31\bar{3} + 9\cdot 0\bar{6} + 7\cdot 03\bar{i} + \cdot 0071\bar{4}$
- (4)  $\cdot 82960\bar{3} + \cdot 563\bar{2} + 59\cdot 03\bar{7} + \cdot 069\bar{2}$

- (5)  $88\cdot063 + 461\cdot034 + \cdot91 + \cdot074$
- (6)  $16\cdot0381 + \cdot02165 + 13 + 5\cdot09613$
- (7)  $3\cdot02 + 5\cdot19 + \cdot00217 + \cdot30216$
- (8)  $7\cdot0428 + 3\cdot69 + 57\cdot031 + 9\cdot0064$
- (9)  $3\cdot0216 + \cdot00621 + 2\cdot814 + 5\cdot9162$
- (10)  $\cdot0313 + \cdot000314 + 5\cdot96 + 8\cdot1254$
- (11)  $\cdot0625 - \cdot0037$
- (12)  $\cdot5167 - \cdot28634$
- (13)  $\cdot4721 - \cdot09989$
- (14)  $1\cdot5623 - \cdot07156$
- (15)  $3\cdot0021 - \cdot1037$
- (16)  $\cdot6032 - \cdot0785196$
- (17)  $1\cdot00316 - \cdot828569$
- (18)  $3\cdot02105 - \cdot072163$
- (19)  $1\cdot2 - 1\cdot1769$
- (20)  $1\cdot13 - \cdot587463$
- (21)  $\cdot1 - \cdot09$
- (22)  $1\cdot00107 - \cdot08372$
- (23)  $1\cdot7 + \cdot037 + 1\cdot92 - 2\cdot0058$
- (24)  $3\cdot031 + \cdot0721 - 2\cdot1396$
- (25)  $4\cdot0026 + 3\cdot157 - \cdot00796$
- (26)  $1\cdot00716 - \cdot00716$
- (27)  $3\cdot284 + \cdot0721 + \cdot036 - \cdot158$
- (28)  $1\cdot0314 + \cdot382 - 1\cdot27603$
- (29)  $\cdot04 - \cdot007132$
- (30)  $\cdot373 + \cdot03 + 51\cdot82 - 16\cdot367$
- (31)  $\cdot03 \times \cdot58$
- (32)  $\cdot0091 \times \cdot7163$
- (33)  $\cdot5906 \times \cdot07$
- (34)  $1\cdot284 \times \cdot0307$
- (35)  $\cdot714235 \times \cdot361$
- (36)  $11\cdot072 \times 5\cdot086$
- (37)  $\cdot11216 \times \cdot0037$
- (38)  $2\cdot8421 \times \cdot0185$
- (39)  $\cdot0041 \times \cdot725$
- (40)  $\cdot00113 \times 4\cdot071$
- (41)  $3\cdot03 \div \cdot58$
- (42)  $1\cdot27 \div \cdot037$
- (43)  $\cdot03142 \div \cdot067$

- (44)  $2\cdot124 \div 3\cdot02$
- (45)  $\cdot026 \div \cdot7895$
- (46)  $\cdot3 \div \cdot1156$
- (47)  $\cdot207 \div 5\cdot294$
- (48)  $11\cdot063 \div 3\cdot21$
- (49)  $\cdot0726 \div 4\cdot647$
- (50)  $\cdot003162 \div 3\cdot158$

## Ex. XI.

Find the value of:—

- (1) 1·5 of 1s.; and 2·25 of £1
- (2) 3·75 of 1*d.*; and 6·625 of £1
- (3) ·1706 of £1; and 3·824 of £5
- (4) ·096 of 10s.; and 20·175 of 2*s.* 6*d.*
- (5) 1·028 of £2. 10; and ·03175 of £1. 10. 0
- (6) ·071695 of £20; and 2·476 of £45
- (7) 3·6825 of £11. 10. 0; and 5·75 of 4 guineas
- (8) 1·026 of 5 half-guineas; and 1·0675 of 13*s.* 4*d.*
- (9) ·7158 of £17. 10. 0; and 11·025 of 5*s.*
- (10) ·625 of £3. 2. 6; and ·0258 of £5. 10. 0
- (11) ·3865 of a ton
- (12) ·96 of 2 tons 10 cwt.
- (13) 5·0375 of a mile
- (14) 1·28625 of 1 lb. Troy
- (15) ·031675 of an acre
- (16) ·8325 of  $2\frac{1}{2}$  acres
- (17) 11·275075 of a year
- (18) 5·19 of a cubic yard
- (19) 3·10025 of 5 ac. 3 roods
- (20) 2·17 of 2 lb. 14 oz.
- (21) ·02755 of 5 days
- (22) ·3125 of a bushel
- (23) 6·325 of 6 cwt. 3 qrs.
- (24) ·706 of 5 tons 11 cwt.
- (25) 3·804 of 8 cwt. 3 qrs. 5 lbs.
- (26) ·625 of 3 yds. 2 ft. 6 in.

- (27) 3·75 of 1 fur. 25 p.
- (28) ·0025 of 2 ac. 3 r. 12 p.
- (29) 61·0765 of a square mile
- (30) ·03136 of 10 tons
- (31) 3·998 of 1 yd. 1 ft. 6 in.
- (32) ·3865 of  $7\frac{1}{2}$  sq. yards
- (33) ·0764 of  $9\frac{3}{4}$  days
- (34) 6·82315 of  $3\frac{1}{2}$  lbs. Troy
- (35) 15·7196 of  $3\frac{3}{4}$  miles
- (36) 3·71625 of 3 hhds.
- (37) 15·007 of 15 leagues
- (38) 1·085 of a barrel (36 gallons)
- (39) ·7162 of a degree (69·1 miles)
- (40) 4·045 of 1 cwt. 2 qrs. 14 lbs.
- (41) 2·15 of £1 + ·0375 of 10 guineas + ·0625 of £10
- (42) ·076 of £5 + ·025 of 5s. + ·02775 of 10s.
- (43) 3·168 of 15s. + ·915 of 6s. 8d. + ·185 of a crown
- (44) 7·013 of £2. 10. 0 + ·15 of £3. 2. 6 + ·04 of 25s.
- (45) ·3 of 3s. 4d. + ·021 of £50 + ·25 of 11s. 6d.
- (46) ·94 of £5 + ·94 of £3 + 1·325 of 2s. 6d.
- (47) 1·8 of £1. 2. 6 + ·046 of  $11\frac{1}{2}$ d. - 1·25 of 15s.
- (48) 3·175 of £100 + 1·225 of 100 guineas - 70·75 of £1
- (49) ·0261 of £5. 8. 4 + 11·5 of 9s. + ·3 of 2s. 6d.
- (50) ·017 of 16s. 8d. + ·142857 of a guinea
- (51) ·09 of 22s. + ·075 of £40 - ·875 of 2s.
- (52) 3·35 of 5 tons + ·103 of 49 tons 10 cwt.
- (53) ·0716 of 495 tons + ·428571 of 2 qrs.
- (54) ·3 of a yard + ·3 of a ft. + ·125 of 1 ft. 4 in.
- (55) ·09 of a furlong + ·01136 of a mile
- (56) ·06 of an hour + ·03 of 1 min. 6 sec.
- (57) ·714285 of a week - ·6 of an hour
- (58) ·076923 of 1 qr. 11 lbs. + ·0714285 of 2 qrs.
- (59) 3·145 of £3. 15. 0 - ·857142 of £2. 16. 0
- (60) ·03 of 1 lb. Troy + ·416 of 1 oz. Troy

## Ex. XII.

Reduce:—

- |      |                |                             |                |
|------|----------------|-----------------------------|----------------|
| (1)  | 2s. 6d.        | to the decimal of £1        |                |
| (2)  | 7s. 6d.        | " "                         | £1. 5. 0       |
| (3)  | 16s. 8d.       | " "                         | £5             |
| (4)  | 3s. 4d.        | " "                         | £1. 6. 8       |
| (5)  | 5s. 6d.        | " "                         | £2             |
| (6)  | £1. 10. 6      | to the decimal of £9. 10. 0 |                |
| (7)  | £10. 10. 0     | " "                         | £1. 4. 0       |
| (8)  | £1. 4. 0       | " "                         | 10 guineas     |
| (9)  | 2s. 7½d.       | " "                         | 4s. 2d.        |
| (10) | 11s. 6¼d.      | " "                         | 5s. 4d.        |
| (11) | £2. 1. 8       | " "                         | 1s. 8d.        |
| (12) | 1s. 8d.        | " "                         | £2. 1. 8       |
| (13) | 3s.            | " "                         | a guinea       |
| (14) | 11s. 10d.      | " "                         | 40s.           |
| (15) | £1. 9. 0½      | " "                         | £10            |
| (16) | 6s. 8d.        | " "                         | £13. 6. 8      |
| (17) | 15s.           | " "                         | a guinea       |
| (18) | 2¾d.           | " "                         | £1. 2. 6       |
| (19) | 4s. 6½d.       | " "                         | 5s. 10d.       |
| (20) | 3s. 4¼d.       | " "                         | 19s. 6d.       |
| (21) | 2 tons 3 cwt.  | to the decimal of 10 tons   |                |
| (22) | 1 cwt. 3 qrs.  | " "                         | half a ton     |
| (23) | 3 oz. 2 dwts.  | Troy                        | " 1 lb. Troy   |
| (24) | 3 yds. 1 ft.   | " "                         | 1 furlong      |
| (25) | 2 ft. 6 in.    | " "                         | a yard         |
| (26) | 5 fur. 13 p.   | " "                         | a mile         |
| (27) | 7 fur. 10 p.   | " "                         | 3 m. 1 fur.    |
| (28) | 12 cwt. 2 qrs. | " "                         | 4 cwt. 2 qrs.  |
| (29) | 4 cwt. 2 qrs.  | " "                         | 12 cwt. 2 qrs. |
| (30) | 5 lbs. 8 oz.   | " "                         | 1 cwt. 8 lbs.  |
| (31) | 40 sq. yds.    | " "                         | an acre        |
| (32) | 3 ac. 2 r.     | " "                         | 28 acres       |
| (33) | 1½ sec.        | " "                         | a minute       |
| (34) | 6° 31'         | " "                         | 5° 20'         |
| (35) | 30' 25"        | " "                         | 2° 30'         |

(36)	1 cubic foot to the decimal of a cubic yard	
(37)	3 nails	2 yards
(38)	1 yd. 3 qrs. 3 n.	1½ yards
(39)	3 bus. 2 pecks	1 qr. 5 bus.
(40)	2¾ pecks	3 bush.
(41)	29 ac. 3 r.	a square mile
(42)	13 ac. 2 r. 20 p.	a square mile
(43)	5 lbs. 4 oz.	8 oz. 8 drams.
(44)	2 scr. 15 grs.	1 lb. Apoth.
(45)	1 lb. Troy	1 lb. Avoir.
(46)	1 lb. Avoir.	1 lb. Troy
(47)	2¾ shillings	a guinea
(48)	5 half-crowns	3 half-guineas
(49)	13¾ florins	£3
(50)	7½ gallons	18 gallons
(51)	10 cwt. 3 qrs.	2 tons 11 cwt.
(52)	5° 13' 40"	12° 30'
(53)	11¾ sq. ft.	4 sq. yards
(54)	9½ guineas	12s. 6d.
(55)	2° 12' 30"	360°
(56)	£1. 7. 9	£2. 1. 8
(57)	12¾ ac.	3 r. 1 p.
(58)	3½ lbs.	2 stones
(59)	£6. 6. 0	£80
(60)	1 ton 11 cwt. 3 qrs. to the decimal of 5 tons 10 cwt.	

## Ex. XIII.

- (1) What is meant by the term "decimal fraction"?
- (2) Express in words .5132.
- (3) What is the effect of multiplying any decimal fraction by 10, 100 or 1000?
- (4) Divide .031 by 10 and 1.037 by 1000.
- (5) Express as vulgar fractions  
.031, .0079, .001 and 7.103.
- (6) Express as decimal fractions: three-tenths, nine thousandths, seven hundred and five ten-thousandths, four hundredths, and six tenths

(7) Find the sum of seventy-nine tenths, five thousandths, eighty-nine ten thousandths, five hundred and four thousandths, and nine tenths.

(8) From  $\cdot 1$  take  $\cdot 0031$  and multiply the remainder by  $\cdot 07$ .

(9) From thrice  $4\cdot 017$  take twice  $\cdot 90516$ .

(10) Find the sum of

$$3\cdot 102 + \cdot 00071 + 5\cdot 876 + 1\cdot 2 + \cdot 31907 + \cdot 027 + 310\cdot 68 + \cdot 0000743 \\ + 38\cdot 691 + \cdot 1041457.$$

(11) Find the sum of  $\cdot 06 + \cdot 031 + \cdot 0028$  + four times  $\cdot 22655$ .

(12) Divide the sum of  $8\cdot 25$  and  $4\cdot 125$  by their difference.

(13) Divide the sum of  $7\cdot 12306$  and  $1\cdot 01758$  by their difference.

(14) Multiply  $\cdot 00315$  by  $\cdot 0713$ .

(15) Express  $\cdot 02695$  as a vulgar fraction.

(16) What is the value of  $\cdot 025$  of £2. 12. 6?

(17) Find the value of £ $\cdot 125 + \cdot 125$  of a guinea +  $\cdot 125$  of a shilling.

(18) How many times may  $\cdot 125$  be taken from 10?

(19) Reduce  $\frac{3}{8}$  to a decimal.

(20) What decimal represents the difference between  $\frac{1}{3}$  and  $\frac{4}{5}$ ?

(21) Express in account money the sum of

$$£\cdot 375 + £\cdot 9604 + £5\cdot 906 + £30\cdot 125.$$

(22) Multiply £10 by  $5\cdot 1\dot{3}\dot{6}$ .

(23) Find the value of  $\cdot 0625$  of 1 ton 10 cwt.

(24) The side of a square field measures  $3769\cdot 05$  yards; what is its area?

(25) A train travels  $7\cdot 306$  furlongs per minute; how many miles does it travel in an hour?

(26) The price of bread is  $1\cdot 25d.$  for  $\cdot 75$  lbs.; what is that per stone?

(27) One hundred and eight steps each  $\cdot 583$  ft. high lead to the summit of a tower; what is its height?

(28) Divide  $1\cdot 2$  by  $\cdot 00012$ .



- (29) Find the value of  $\cdot 03156$  of £11. 12. 9.
- (30) Multiply  $\cdot 0313\bar{2}$  by  $7\cdot 09\bar{5}$  correct to seven places of decimals.
- (31) Reduce  $\frac{11}{4}\bar{3}$  to a decimal.
- (32) Find the value of  $11\frac{5}{23}$  of £47. 5.  $4\frac{3}{4}$ , and express the result as a decimal of £100.
- (33) Find the sum of  $\cdot 27$  cwt. +  $\cdot 385$  tons +  $\cdot 071428\bar{5}$  of 3 qrs. +  $\cdot 625$  of 3 qrs. 6 lbs.
- (34) What would be the cost of 13·07625 tons of soda at  $\cdot 09d.$  per lb.?
- (35) Reduce  $\frac{4}{23}$  to a decimal.
- (36) A stone is 3·87 ft. long, 2·465 ft. broad, and 1 ft. 6 in. thick; what is its solidity?
- (37) The specific gravity of dry oak is to water as  $\cdot 6777$  is to 1. Express this as a vulgar fraction.
- (38) Wheat contains in every 100 parts, water 14, flesh-forming substances 14·6, heat-givers 66·4, accessories 3·4, and mineral matters 1·6 parts by weight. What weight of each is there in a bushel of wheat weighing 60 lbs.?
- (39) Reduce
- $$\frac{1\cdot 5 + 2\cdot 96}{4\cdot 46} + \frac{2\cdot 75 \text{ of } 1\cdot 0\bar{9}}{\cdot 025 \times \cdot 12} + \frac{3\cdot 5\bar{9} \text{ of } \cdot 025}{\cdot 09}$$
- to its simplest form.
- (40) On the equator the length of a pendulum beating seconds is 39·0168 inches and at the poles 39·217 inches. Express the difference as the decimal of a yard.
- (41) Multiply £3. 12. 6 by  $\cdot 0756$ .
- (42) Divide  $\cdot 001$  by  $7\cdot 568$ .
- (43) Reduce £3. 1.  $7\frac{1}{2}$  to the decimal of £8.
- (44) Express  $\frac{17}{11}\bar{9}$  as a decimal.
- (45) Reduce  $\cdot 42857\bar{1}$  to a vulgar fraction.
- (46) How many cubic feet of water are contained in a tank 30·125 ft long, 11·08 yds. wide, and 6 ft. deep?

- (47) Reduce 13'6s. to the decimal of £1. 10. 11½.
- (48) Find the cost of 114'3165 tons of cast-iron at £5. 10. 0 per ton.
- (49) Find the weight of 373'025 ft. of girder iron at 23'076 lbs. per yard.
- (50) Divide the difference between 3'1047 and '0731 by the sum of 1'27 and 11'384.
- (51) Find the value correct to seven places of decimals of  
 $62'0073 \div '5580657$ .
- (52) Reduce '012345679 to a vulgar fraction.
- (53) Add together £10'158 + £11'068½ + £'069.
- (54) The  $\frac{1}{100}$  part of an inch of gold thread contains  $\frac{1}{7200000}$  of a grain of that metal. Express this as a decimal of 1 lb. Troy.
- (55) The mean temperature for June was 70'1906 degrees, for July 68'53, and for August 76'007; what was the mean for the three months?
- (56) Give the corresponding decimals to £ $\frac{1}{8}$ ,  $\frac{7}{8}$ s.,  $\frac{5}{4}$ d.
- (57) Divide £40. 5. 0 by 8'05, and reduce the quotient to the decimal of £20.
- (58) The annual death-rate in a town containing 80,000 inhabitants is 29'075 per thousand. How many persons died in a quarter of a century?
- (59) Divide 10½ by '012345679.
- (60) If wheat is sold at 1'875s. per peck, what is the price per quarter?
- (61) If the cost of making and distributing penny postage stamps averages '0125d. each, what is the gain on the sale of 12 millions of stamps?
- (62) What is the cost of 13½ gross of flower-pots at 5'037d. per dozen?
- (63) A person gains '05s. in the £ by the sale of £360 worth of goods. What is his entire gain?
- (64) The price of land is 3'175d. per sq. yard; what is that per acre?

- (65) Multiply 1 cwt. 2 qrs. 14 lbs. by  $\cdot 428571$ .
- (66) The Mint price of gold is £3·89375 per ounce; what is the value of 138 lbs. 10 oz.?
- (67) Find the value of 9·8 guineas +  $\cdot 625$  of a shilling +  $\cdot 00375$  of £40.
- (68) Express 9 cwt. 3 qrs. 12 lbs. 8 oz. as the dec. of 2 tons 10 cwt.
- (69) From £9·6 take  $5\cdot 03\bar{7}$  of a guinea.
- (70) How many times is  $9\cdot 03\bar{7}$  poles contained in 244 acres?
- (71) A merchant buys 376 cwt. 3 qrs. 12 lbs. of sugar at  $3\cdot 3d.$  per lb. and sells it at the rate of £1. 15. 0 per cwt. What does he gain?
- (72) Reduce 5 oz. 15 dwts. 12 grs. to the decimal of a lb. Troy.
- (73) What is the rent of a farm of  $520\cdot 876$  acres at £2·964 per acre?
- (74) A piece of gold weighing a lb. was made into 50 rings: what was the weight of each, allowing  $\cdot 943$  oz. waste in manufacturing?
- (75) Find the continued product of 1·3, 1·03,  $\cdot 013$ , and  $100\cdot 0013$ .
- (76) Reduce  $\frac{13}{14}$ ,  $\frac{1}{15}$  and  $\frac{1}{16}$  to decimals, and find the decimal corresponding to the quotient obtained by dividing the greatest by the least.
- (77) Find the difference between  $\cdot 71428\bar{5}$  of 3 half-guineas and  $6\cdot 9845$  of 5 half-crowns.
- (78) Multiply  $\cdot 03104$  by  $\cdot 0217\bar{3}$ .
- (79) Find the value of  $\cdot 07385$  of an acre.
- (80) Reduce  $\cdot 07916\bar{5}$  to a vulgar fraction.
- (81) What is the weight of 11 trucks of coal, each weighing 9 tons  $13\cdot 58$  cwts.?
- (82) Find the value of £7·148 +  $6\cdot 314s.$  +  $10\cdot 25d.$
- (83) Reduce a mile to the decimal of a knot (2000 yds.).
- (84) In every 100 parts by weight turnips contain 90·5 parts water: what weight of water is there in a ton of turnips?
- (85) Reduce  $6^0\ 13'\ 22''$  to the decimal of a quadrant ( $90^0$ ).

(86) How many times will a wheel 10·175 ft. round revolve in going a distance of 5 miles?

(87) The circumference of a circle is 3·1416 times the diameter; what is the diameter of a circle whose circumference is 219·912 ft.?

(88) Rice contains 74·1 per cent. of starch, potatoes 15·5 per cent.; how much starch would be contained in a cwt. of each?

(89) Find the value of 795 cwt. + 968 qr. + 915 lb. - 03 of a ton.

(90) Reduce  $\frac{15\cdot7 - 14\cdot037}{\cdot025} + \frac{5\cdot027}{\cdot072} - \frac{3\cdot25 \text{ of } 4}{4\cdot3 \times \cdot230769}$

to its simplest form.

(91) Divide the sum of 13·3 and 1·33 by their difference.

(92) What decimal multiplied by 62·5 will give 1?

(93) A canal is 17 miles long, with an average width of 30 ft. and depth of 5·09 ft. How many cubic feet of water does it contain?

(94) Multiply £10. 12. 1 by 3·675.

(95) Find the value of 0968 of a year.

(96) Divide 3·0072 by  $\frac{5}{8}$  of 4·561.

(97) Reduce £2. 1. 9½ to the decimal of £4. 10. 0.

(98) Reduce the difference between 3½ guineas and £3·207 to the decimal of £1.

(99) What is the cost of 529615 c. feet of gas at £·225 per thousand feet?

(100) If a lb. of tea cost 1·2916s., what would 6428571 of a cwt. cost?

## SIMPLE PRACTICE.

Find by Practice the value of

(1)	120	at	1 <i>s.</i> 6 <i>d.</i>	(29)	440	at	£1. 3. 4
(2)	134	„	6 <i>d.</i>	(30)	159	„	£1. 12. 6
(3)	284	„	4 <i>d.</i>	(31)	316	„	£1. 17. 6
(4)	130	„	4½ <i>d.</i>	(32)	7210	„	£1. 16. 8
(5)	99	„	5 <i>d.</i>	(33)	86	„	£1. 13. 4
(6)	111	„	5½ <i>d.</i>	(34)	9905	„	£2. 1. 8
(7)	73	„	8 <i>d.</i>	(35)	723	„	£2. 15. 0
(8)	75	„	9½ <i>d.</i>	(36)	896	„	£3. 17. 0
(9)	179	„	10¾ <i>d.</i>	(37)	3117	„	£2. 19. 0
(10)	58	„	11¼ <i>d.</i>	(38)	538	„	£2 16. 8
(11)	29	„	2 <i>s.</i> 6 <i>d.</i>	(39)	1147	„	£1. 10. 10
(12)	38	„	5 <i>s.</i> 0 <i>d.</i>	(40)	599	„	£3. 18. 4
(13)	57	„	13 <i>s.</i> 4 <i>d.</i>	(41)	647	„	£7. 15. 6
(14)	138	„	15 <i>s.</i> 0 <i>d.</i>	(42)	8396	„	£11. 10. 8
(15)	73	„	17 <i>s.</i> 6 <i>d.</i>	(43)	729	„	£5. 16. 9
(16)	119	„	16 <i>s.</i> 8 <i>d.</i>	(44)	106	„	£3. 19. 9
(17)	204	„	18 <i>s.</i> 0 <i>d.</i>	(45)	1137	„	£2. 11. 5
(18)	193	„	19 <i>s.</i> 6 <i>d.</i>	(46)	1216	„	£8. 14. 2
(19)	726	„	14 <i>s.</i> 7 <i>d.</i>	(47)	1100	„	£2. 12. 11
(20)	302	„	13 <i>s.</i> 11 <i>d.</i>	(48)	1135	„	£4. 9. 10
(21)	98	„	16 <i>s.</i> 5 <i>d.</i>	(49)	1604	„	£5. 0. 10
(22)	147	„	11 <i>s.</i> 10 <i>d.</i>	(50)	1998	„	£2. 0. 9
(23)	562	„	19 <i>s.</i> 9 <i>d.</i>	(51)	738	„	£13. 7. 9½
(24)	835	„	7 <i>s.</i> 7½ <i>d.</i>	(52)	1551	„	£8. 6. 7½
(25)	916	„	3 <i>s.</i> 6 <i>d.</i>	(53)	527	„	£2. 2. 2½
(26)	527	„	18 <i>s.</i> 4½ <i>d.</i>	(54)	1663	„	£7. 13. 1½
(27)	608	„	11 <i>s.</i> 9½ <i>d.</i>	(55)	1876	„	£6. 14. 9¼
(28)	1309	„	12 <i>s.</i> 10½ <i>d.</i>	(56)	998	„	£9. 5. 8¾

(57)	711	at	£3. 11. 10	(79)	400	at	£13. 13. 0½
(58)	804	„	£50. 15. 5½	(80)	576	„	£23. 17. 6
(59)	1016	„	£11. 12. 9¼	(81)	740	„	£3. 11. 5¼
(60)	119	„	£1. 0. 11½	(82)	908	„	£7. 17. 0¾
(61)	35	„	£2. 9. 8¼	(83)	444	„	£6. 19. 11¾
(62)	113	„	£1. 19. 11¾	(84)	816	„	£12. 12. 6
(63)	720	„	£3. 14. 10¾	(85)	1039	„	£1. 19. 4¾
(64)	999	„	£6. 11. 7½	(86)	960	„	£1. 19. 11¾
(65)	960	„	£1. 0. 0¾	(87)	1475	„	£123. 6. 8½
(66)	1025	„	£15. 13. 9¼	(88)	405	„	£73. 2. 9¼
(67)	374	„	£9. 11. 0¾	(89)	8½	„	£1. 12. 2
(68)	501	„	£2. 18. 4½	(90)	19½	„	£7. 11. 5
(69)	143	„	£3. 6. 5	(91)	102¼	„	£4. 17. 6
(70)	236	„	£3. 14. 11¼	(92)	36¾	„	£3. 10. 7
(71)	109	„	£1. 16. 7½	(93)	199½	„	£1. 14. 10
(72)	149	„	£3. 19. 8½	(94)	56¾	„	£2. 2. 8
(73)	702	„	£2. 0. 5¼	(95)	80¾	„	£7. 12. 8
(74)	864	„	£6. 13. 9	(96)	179½	„	£1. 6. 9¼
(75)	132	„	£4. 5. 8¼	(97)	38¼	„	£14. 19. 6
(76)	203	„	£7. 12. 11	(98)	601¼	„	£20. 5. 8
(77)	446	„	£9. 11. 10	(99)	73¼	„	£2. 9. 9½
(78)	399	„	£7. 11. 11¾	(100)	62¾	„	£5. 14. 7

(101) Find the cost of 112 bushels of barley at 6s. 2½d. per bushel.

(102) What is the cost of 372 bags of linseed at £1. 11. 10½ per bag?

(103) A person owes £2100, and pays 3s. 9d. in the £; what is the amount of his assets?

(104) What is the cost of laying 318 miles of railway at £2916. 13. 8 per mile?

(105) Find the value of 4 pieces of gold, each 13¼ ounces, at the rate of £3. 17. 10½ per oz.

(106) Find the value of 1309 roubles at 2s. 5½d. each.

(107) What is the salary for a year (365 days) at £1. 1. 11¼ per day?

(108) Find the interest on a sum of money for 111 days at the rate of 11s. 7¼d. per day.

(109) What is the rent of 29 houses at £13. 14. 2 each per year?

(110) What will a rate of 1s.  $3\frac{1}{2}d.$  in the £ produce on a rateable value of £9091?

(111) If the annual cost per head for the maintenance of troops be £44. 9. 8, what would be the cost of maintaining 25000 men?

(112) What is the cost of 1396 bushels of apples at  $10\frac{1}{2}d.$  a peck?

(113) What is the cost of driving  $158\frac{1}{2}$  yards of piles at an average cost of £2. 11.  $10\frac{1}{2}$  per yard?

(114) What is the amount of a bankrupt's assets who fails for £21009 and pays 11s.  $10\frac{3}{4}d.$  in the £?

(115) What is the cost of an article of silver plate weighing  $93\frac{1}{2}$  ounces if the silver cost 5s.  $8d.$  per oz. and workmanship 2s.  $9d.$  per oz.?

(116) What is the total loss in 6 years' wear of iron rails, if in that period a railway company buys 3726 tons of new rails at £11. 16. 0 per ton, and sells annually 479 tons of old ones at £8. 9. 7 per ton?

(117) What is the value of 329 bales of cotton at £11. 13.  $9\frac{1}{2}$  per bale?

(118) What is the cost of 11 logs of mahogany, each 104 cub. ft., at £2. 9. 10 per cub. ft.?

(119) Express in account money the value of 1131 merks, each 13s.  $4d.$

(120) Find the value of a rick of hay containing  $11\frac{3}{4}$  tons at four guineas per ton.

(121) What sum would be paid by 19 travellers, taking return tickets, Birmingham to Paris, at £3. 16.  $9\frac{3}{4}$  each?

(122) Find the value of  $118\frac{1}{2}$  tons of scrap iron at £4. 11.  $9\frac{1}{2}$  per ton.

(123) What is the cost of 706500 fire-bricks at three guineas and a half per thousand?

(124) Find the rent of  $1103\frac{1}{4}$  acres of land at £4. 17.  $8\frac{1}{2}$  per acre.

(125) What is the cost of paving 208 sq. poles of roadway at 11s.  $7\frac{1}{2}d.$  per sq. yd.?

(126) A nobleman with a rent roll of £24000 a year pays a land tax of  $7d.$  in the £ upon it, and an income tax of  $4d.$  in the £ on his net rental. What amount does he receive?

(127) Find the cost of 17 pieces of cloth, each 91 yards, at 14s. 6d. per yard.

(128) By how much does the cost of  $11\frac{1}{4}$  yds. of carpet at 3s. 6d. exceed the cost of  $13\frac{1}{2}$  yds. at half a crown per yard?

(129) Find the cost of 103 yds. of linen at 2s.  $10\frac{1}{2}$ d. per yard.

(130) What is the cost of 609 lineal feet of floorcloth at 13s.  $8\frac{1}{2}$ d. per yard?

(131) What is the cost of 140 dozen of table-knives, half at 9s. 8d. per dozen and the rest at 10s. 2d. per dozen?

(132) What is the cost of  $90\frac{1}{2}$  dozen pairs of boots at 12s. 9d. per pair?

(133) Find the whole cost of  $11\frac{1}{2}$  yds. of calico at 7d.,  $9\frac{1}{2}$  yds. at  $8\frac{1}{2}$ d., and 103 yards at  $5\frac{1}{2}$ d.

(134) What is the value of 10 qrs. 3 bus. of wheat at 6s.  $10\frac{1}{2}$ d. per bus.?

(135) What would be the cost of sinking a shaft 3 yards square by 69 feet deep at a cost of £1. 11.  $10\frac{3}{4}$  per solid yard?

(136) What would be the value of the butter produced by 1470 cows in a year if each produced  $5\frac{1}{4}$  lbs. weekly, the selling price being 18s. per stone?

(137) What is the cost of carriage for  $30\frac{1}{2}$  miles at  $9\frac{1}{2}$ d. per mile?

(138) What is the cost of 107 shares at £93. 15. 8 each?

(139) A gold miner pays £1. 10. 0 per month for license to dig. During 11 months he finds seven nuggets, each  $5\frac{1}{2}$  oz. on the average, and  $316\frac{1}{2}$  ounces of gold dust. What is his net gain if he sells the gold dust at £3. 4. 6 and the nuggets at £3. 14. 11 per oz.?

(140) If 319 doz. Reading Books at 18s. per doz., 193 doz. at 16s. 6d., and 111 doz. at 11s. 3d. be sold in the course of a year, what money should be received for them if 2d. in every shilling be allowed purchasers as discount?

(141) Find the cost of  $12\frac{1}{4}$  tons of guano at 9s.  $7\frac{1}{2}$ d. per cwt.

(142) What is the cost of  $111\frac{1}{2}$  bus. of grass seeds at 31s. 9d. per bus.?



(143) Find the whole cost of  $32\frac{1}{2}$  tons of Swede turnips at £4. 6. 3 per ton, and  $5\frac{1}{4}$  tons of Mangold at £4. 7. 8.

(144) What amount of money will pay the wages of 320 men for a week if each earns £1. 11.  $10\frac{1}{2}$ ?

(145) What would be the entire cost of 8 vans of salt, each 5 tons 15 cwt., at £2. 18. 10 per ton, the cost of carriage being 5s.  $3\frac{1}{2}$ d. per ton?

(146) *A* works 37 weeks, receiving  $3\frac{3}{4}$  guineas per week, *B* works 43 weeks 3 days, at 7s. 9d. per day, and *C* works 36 weeks 3 days (9 hrs. daily), and is paid  $9\frac{1}{2}$ d. per hour. How much do they earn altogether?

(147) Find the value of 3061 sacks of flour at £2. 7.  $3\frac{1}{2}$  per sack.

(148) What is the total cost of 31 lbs. cheese at  $9\frac{1}{2}$ d., 43 lbs. bacon at 8 $\frac{1}{4}$ d., and 3 hams, each 15 $\frac{1}{4}$  lbs., at 1s. per lb.?

(149) What will a rate of  $11\frac{1}{2}$ d. in the £ produce on an assessment of £447. 10. 0?

(150) What is the cost of  $16\frac{2}{3}$  cwt. of sugar at the rate of three half-crowns per qr.?

## COMPOUND PRACTICE.

- (1) 2 tons 10 cwt. at 13s. per ton.
- (2) 3 cwt. 2 qrs. 14 lbs. at £2. 1. 4 per cwt.
- (3) 33 lbs. 11 oz. at 6s. 8d. per lb.
- (4) 5 lbs. 14 oz. 8 drs. at 16s. per lb.
- (5) 110 cwt. 3 qrs. 21 lbs. at £2 per cwt.
- (6) 3 cwt. 3 qrs. 21 lbs. at £1. 10. 0 per cwt.
- (7) 11 tons 17 cwt. 3 qrs. 14 lbs. at £4. 10. 0 per ton.
- (8) 110 tons 11 cwt. 3 qrs. 14 lbs. at £9 per ton.
- (9) 36 cwt. 3 qrs. 19 lbs. at £1. 14. 0 per cwt.
- (10) 11 cwt. 3 qrs. 12 lbs. 8 oz. at £14 per ton.
- (11) 58 ac. 3 r. 25 p. at £320 per acre.
- (12) 7 ac. 2 r. 11 p. at £125 per acre.
- (13) 11 lbs. 8 oz. 15 dwts. 12 grs. at £2. 2. 0 per lb.
- (14) 5 yds. 1 ft. 9 in. at 13s. 6d. per yard.
- (15) 11 yds. 2 ft. 11 in. at 14s. per yard.
- (16) 15 cub. yds. 9 ft. 576 in. at £12 per yd.
- (17) 8 sq. yds. 5 ft. 112 in. at £7. 7. 0 per sq. yd.
- (18) 103 qrs. 7 bus. 3 pks. 1 gal. at £4. 5. 0 per qr.
- (19) 73 lds. 3 qrs. 5 bus. 3 pks. at £4. 4. 0 per qr.
- (20) 131 yrs. 39 wks. at £52. 10. 0 per year.
- (21) 38 qrs. 18 lbs. 9 oz. at £1. 8. 0 per qr.
- (22) 123 yds. 3 qrs. 3 nls. at 11s. 6d. per yard.
- (23) 404 lbs. 5 oz. 6 drs. 2 scr. at £5. 10. 0 per lb.
- (24) 119 tons 7 cwt. 13 lbs. at £2. 10. 0 per ton.

- (25) 73 oz. 5 dr. 1 sc. 15 grs. at £6. 0. 0 per lb.
- (26) 16 ac. 1 r. 12 p. at £17. 17. 0 per acre.
- (27) 119 yds. 2 ft. 11 in. at £1. 3. 7 per yd.
- (28) 15 tons 13 cwt. 3 qrs. 9 lbs. at £3. 0. 0 per cwt.
- (29) 5 qrs. 27 lbs. 3 oz. 8 drs. at £1. 1. 8 per lb.
- (30) 13 yds. 3 qrs. 3 n. 1 in. at £1. 19. 6 per yd.
- (31) 303 sq. yds. 5 ft. 104 in. at £7. 1. 6 per sq. yd.
- (32) 16 tons 13 cwt. 3 qrs. 14 lbs. at £2. 9. 0 per ton.
- (33) 7 tons 5 cwt. 1 qr. 19 lbs. at £5. 12. 0 per cwt.
- (34) 13 yds. 2 ft. 6 in. at £1. 11. 6 per yd.
- (35) 8 yds. 1 ft. 9 in. at 6s. 9d. per yd.
- (36) 73 qrs. 5 bus. 3 pks. at 73s. per qr.
- (37) 19 qrs. 4 bus. 3 pks. at 58s. 6d. per qr.
- (38) 11 lbs. 5 oz. 10 dwts. at £3. 16. 0 per lb.
- (39) 18 yrs. 5 mths. 1 wk. at £50 per year.
- (40) 11 yds. 1 ft. 6 in. at £1. 9. 4 per yd.
- (41) 20 lbs. Avoir. 10 oz. 8 drs. at £1. 5. 0 per lb.
- (42) 114 lbs. Avoir. 8 oz. at £1. 8. 0 per cwt.
- (43) 90 ac. 3 r. 20 p. at £5. 0. 0 per acre.
- (44) 17 ac. 1 r. 28 p. at £7. 16. 0 per acre.
- (45) 7 tons 3 cwt. 2 qrs. 21 lbs. at £2. 0. 0 per ton.
- (46) 15 cwt. 3 qrs. 24 lbs. at £7 per ton.
- (47) 15 qrs. 6 bus. 3 pks. at £4 per qr.
- (48) 3 qrs. 5 bus. 2 pks. at £3. 9. 0 per qr.
- (49) 19 sq. yds. 5 ft. 110 in. at £17. 0. 0 per sq. yd.
- (50) 51 ac. 3 r. 11 p. at £6. 10. 0 per acre.
- (51) 115 cub. yds. 9 ft. 864 in. at £3 per c. yd.
- (52) 71 lbs. 11 oz. 5 dwts. at £1. 3. 6 per lb.
- (53) 13 qrs. 22 lbs. 12 oz. at £10 per qr.
- (54) 105 yrs. 73 days at £50. 10. 0 per yr.
- (55) 36 wks. 3 dys. 12 hrs. at £2. 2. 0 per week.
- (56) 1215 yds. 3 qrs. 3 nls. at 3s. 6d. per yard.

- (57) 11 yds. 1 qr. 3 nls. at 5s. 8d. per yard.
- (58) 135 yds. 2 ft. 9 in. at 11d. per yard.
- (59) 42 yds. 1 ft. 8 in. at 1s. 8d. per yard.
- (60) 1900 ac. 3 r. 14 p. at £13. 10. 0 per acre.
- (61) 173 lbs. 8 oz. 9 dwts. 18 grs. at £3. 17. 10½ per oz.
- (62) 21 ac. 3 r. 25 p. at £8 per acre.
- (63) 17 yds. 1 ft. 3 in. at 4s. 8d. per yard.
- (64) 111 sq. yds. 8 ft. 56 in. at 3s. per sq. yd.
- (65) 58 qrs. 6 bus. 2 pks. at £3. 1. 0 per qr.
- (66) 110 days 15 hrs. 30 min. at 11s. 8d. per day.
- (67) 105 cub. yds. 9 ft. 1000 in. at £70 per cub. yd.
- (68) 11 tons 13 cwt. 3 qrs. at 16s. 8d. per ton.
- (69) 51 cwt. 2 qrs. 11 lbs. at 16s. 8d. per ton.
- (70) 19 lbs. 11 oz. 13 drs. at 5s. per lb.
- (71) 113 cwt. 1 qr. 15 lbs. at 8s. 6d. per ton.
- (72) 58 yds. 1 ft. 5½ in. at 2s. 6d. per yard.
- (73) 17 yds. 2 ft. 11¼ in. at 6s. per yard.
- (74) 101 yds. 3 qrs. 2 n. 2 in. at 11s. per yard.
- (75) 133 sq. yds. 5 ft. 72 in. at 3½d. per sq. yard.
- (76) 15 ac. 3 r. 12¾ p. at £105 per acre.
- (77) 203 m. 5 f. 19 p. at £6. 15. 0 per mile.
- (78) 17 lbs. 5 oz. 4 dwts. 20 grs. at £1. 10. 6 per oz.
- (79) 5 tons 13 cwt. 13 lbs. at £1. 1. 0 per ton.
- (80) 7 qrs. 5 bus. 1 pk. at £3. 5. 0 per qr.
- (81) 3 tons 11¼ lbs. at £2. 10. 0 per cwt.
- (82) 705 cub. yds. 19½ c. ft. at £7. 16. 0 per cub. yd.
- (83) 115 ac. 38 poles at £5. 5. 0 per acre.
- (84) 36¾ lbs. Troy at 6s. per ounce.
- (85) 19½ lbs. Avoir. at £2. 2. 0 per cwt.
- (86) 32131 qrs. 5 bus. at £15. 10. 0 per load.
- (87) 2 lbs. 5 oz. 5 dwts. at 19s. 6d. per lb.
- (88) 1101 ft. 11 in. at 3s. 6d. per yard.

- (89) 156 yds. 2 ft.  $4\frac{1}{2}$  in. at 8s. per yard.
- (90) 21 years 315 days at £90. 12. 0 per year.
- (91) 5 mo. 3 wks. 5 days at £3. 10. 0 per month.
- (92) 316 days 5 hours 36 min. at £3 per day.
- (93) 16 tons 11 cwt.  $19\frac{1}{2}$  lbs. at £4 per cwt.
- (94) 3 qrs. 15 lbs. 12 oz. at 6s. per lb.
- (95) 54 tons 9 cwt. 3 qrs. 11 lbs. at £6. 8. 0 per cwt.
- (96) 109 ac. 3 r. 19 p. at £7. 16. 0 per acre.
- (97) 39 hhds. 15 gals. 3 qts. at 18s. per hhd.
- (98) 1091 gals. 3 qts. 1 pt. at 3s. per gallon.
- (99) 715 sq. yds. 7 ft. 110 in. at £1. 6. 0 per sq. yd.
- (100) 21 ac. 3 r.  $11\frac{1}{4}$  p. at  $3\frac{1}{4}$ d. per sq. yd.
- (101) 83 lbs. 9 oz. 11 drs. at 5s. per lb.
- (102) 50 packets, each 3 lbs.  $5\frac{1}{2}$  oz., at 3s. 4d. per lb.
- (103) 111 packages, each 17 cwt. 1 qr. 10 lbs., at £1. 1. 0 per ton.
- (104) 38 parcels, each 83 yds. 1 qr. 2 nls., at 7s. 6d. per yd.
- (105) 15 parcels, each 104 yds. 3 qrs. 3 nls., at 2s. 6d. per yd.
- (106) 7 plots, each 38 ac. 3 r.  $29\frac{1}{2}$  p., at £5. 10. 0 per ac.
- (107) 13 plots, each 91 ac. 1 r.  $10\frac{1}{4}$  p., at £4. 4. 0 per ac.
- (108) 17 loads, each 1 ton 3 cwt. 1 qr. 5 lbs., at £1 per ton.
- (109) 6 loads, each 14 cwt. 21 lbs., at 15s. 8d. per ton.
- (110) 111 ac. 3 r.  $19\frac{1}{2}$  poles at £2 per acre.
- (111) 73 casks, each 36 gals. 1 qt. 1 pt., at 10s. per gal.
- (112) 15 casks, each weighing 5 qrs. 11 lbs. 8 oz., at 25s. per cwt.
- (113) 300 loads, each 1 ton 2 cwt. 2 qrs., at 11s. 6d. per cwt.
- (114) 51 hhds., each 1 cwt. 3 qrs. 17 lbs., at 8s. 6d. per ton.
- (115) 11 pieces, each 105 yds. 3 qrs. 3 n., at 2s. per yd.
- (116) 721 pieces, each 9 yds. 0 ft.  $5\frac{1}{2}$  in., at 6s. per yard.
- (117) 13 packets, each 2 lbs. 5 oz. 5 dwts. Troy, at £3. 16. 0 per oz.
- (118) 121 packets, each 3 lbs. 2 oz. 7 dwts. Troy, at 5s. 10d. per oz.
- (119) 17 tons 11 cwt. 3 qrs. 15 lbs. 8 oz. at £2. 16. 0 per ton.
- (120) 15 ac. 3 r. 17 poles 20 yds. at £16 per acre.

- (121) Find the cost of 11 cwt. 3 qrs. of coal at 15s. 6d. per ton.
- (122) What is the weight of 60 packages, each 5 cwt. 1 qr. 7 lbs.?
- (123) Find the value of 11 lbs. 5 oz. 13 dwts. at £4 per oz.
- (124) What is the charge for carrying 11 tons 5 cwt. 3 qrs. 14 lbs. of goods at the rate of 13s. 4d. per ton?
- (125) What weight of coals is burnt in 85 days if 3 cwt. 3 qrs. 21 lbs. be consumed per day?
- (126) How many cubic yards may be excavated in 120 days at the rate of 5 cub. yards 9 ft. 864 in. per day?
- (127) Find the cost of 11 yds. 3 qrs. 3 n. at 11s. 6d. per yard.
- (128) What is the value of 93 qrs. 5 bus. 3 pks. at 51s. 6d. per qr.?
- (129) Find the rent of 504 ac. 3 r. 13 p. at £4 per acre.
- (130) If in estimating the rateable value of an estate one-sixth part is allowed off the Gross Rental, what is the rateable value of 3102 ac. 3 r. of land, the rent of which is £6. 15. 0 per acre?
- (131) Find the rent of a farm of 375 acres, of which 198 acres 1 r. 20 p. is grass land at £7. 10. 6 per acre and the rest arable at £4. 19. 0 per acre.
- (132) How many miles &c. are there in  $35^{\circ} 30' 20''$  longitude on a parallel of latitude on which  $1^{\circ}$  measures 62 miles?
- (133) From 1 cwt. 1 qr. 1 lb. take 2 qrs. 11 lbs., and find the value of the remainder at 30s. per cwt.
- (134) Find the cost of  $11\frac{1}{2}$  stones of bran at  $11\frac{1}{2}$ d. per stone.
- (135) What is the cost of 7 blocks of stone, each 11 cwt. 1 qr. 14 lbs., at £2. 1. 0 per cwt.?
- (136) A ton of straw cost £4. 10. 0: what is that for 1 ton 11 cwt. 2 qrs. 14 lbs.?
- (137) Find the cost of cutting a new road 7 m. 5 fur. 154 yds. long at £450 per mile.
- (138) What is the cost of 13 tons 3 qrs. 21 lbs. of salt at 8s. per cwt.?
- (139) Find the value of 11 yds. 1 qr. 1 n. of cloth at 9s. 10d. per yard.

(140) What is the rent of a house for 5 years 73 days at £12. 10 per annum?

(141) What sum will be required to pay for 131 bus. 3 pks. 1 gallon of seed potatoes at 2s. 6d. per bushel?

(142) Find the cost of 11 ac. 3 r. 31 p. of land at £170. 16. 0 per acre.

(143) What is the cost of paving a court-yard 103 ft. 6 in. by 15 yds. 2 ft. 6 in. at 3s. 6d. per square yard?

(144) Find the cost of 160 cwt. 3 qrs. 11 lbs. of sugar at 28s. per cwt. if 1s. in the £ be deducted for cash.

(145) Find the value of 6 bales of silk, each 36 yds. 11 inches, at 14s. 9d. per yard.

(146) Find the entire cost of 11 cwt. 1 qr. of tobacco at £20. 10. 0 per cwt. and 5 cwt. 3 qrs. 11 lbs. at 20 guineas per cwt.

(147) What is the cost of 29 firkins of butter, each 1 cwt. 1 qr. 14 lbs., at £6. 10. 0 per cwt.?

(148) Find the cost of 11 lbs. 8 oz. 6 dr. of nutmegs at 1s. per lb. Avoirdupois.

(149) Find the weight of 116 packages, each 11 cwt. 3 qrs. 15½ lbs.

(150) Find the area of 726 plots of land, each 1 ac. 3 r. 12 p. 20 yds.

(151) What is the rent of 1 ac. 3 r. 12 p. 10 yds. at £24. 4. 0 per acre?

(152) What is the cost of 23 sacks of potatoes, each 15½ stones, at £7 per ton?

(153) A farmer sows 13 ac. 3 r. 30 p. of peas and 42 ac. 2 r. of beans. On the former he realises £12. 10. 0 per acre and on the latter £10. 10. 0; what is his profit after paying £4. 15. 0 per acre rent?

(154) Find the cost of 127 tons 13 cwt. 3 qrs. 14 lbs. of steel rails at £13. 10 per ton.

(155) What is the cost of 37 oz. 13 dwt. of silver at 8s. per oz.?

(156) Find the value of 16 packs of cloth, each 39 yds. 3 qrs. 3 nls., at the rate of 11s. 9d. per yard.

(157) What is the cost of the leaden lining of a cistern 11 yards long, 12½ ft. broad, and 4 ft. deep, the lead weighing 16 lbs. per square foot, and costing £2. 3. 9 per cwt.?

(158) What is the cost of a block of marble weighing 11 tons 13 cwt. 13 lbs. at £9. 6. 8 per ton?

(159) Find the whole cost of

5 cwt. 3 qrs. 11 lbs. cheese at £2. 5. 0 per cwt.

11 cwt. 3 qrs. 17 lbs. do. at £3. 0. 0 per cwt.

2 cwt. 1 qr. 19 lbs. do. at £3. 10. 0 per cwt.

(160) Find the cost of 1314 bars of soap, each 3 lbs., at £2. 6. 6 per cwt.

(161) A ton of goods cost for conveyance 11s. 6d.: what would be the cost of 8 packages, each weighing 4 cwt. 1 qr. 14 lbs.?

(162) Bought 50 barrels of pearl ashes, each 3 qrs. 19 lbs., at £5 per cwt.: what did I pay for them?

(163) Find the cost of 1 ton 3 cwt. 1 qr. 11 lbs. of copperas at 5s. 6d. per cwt.

(164) What is the cost of 5 puncheons of whiskey, each 165 gallons, at 15s. 8d. per gallon, if a shilling in the £ be allowed for prompt payment?

(165) Find the cost of 11 cases of gunpowder, each containing 93 lbs., at £7. 10. 0 per cwt.

(166) What is the value of 18 casks of brandy, each 53 gallons 3 qts. 1 pt., at 27s. per gallon?

(167) If I bought at Canton 93 chests of tea, each 96 lbs., what did they cost me when delivered in London if I paid £8 per cwt. for the tea, £1. 10. 0 per cwt. carriage, and 6d. per lb. duty?

(168) Find the value of 13 tons 11 cwt. 14 lbs. of salt at £4 per ton.

(169) What was the cost of 27 armour-plates, each weighing 13 tons 14 cwt. 3 qrs., at £13 per ton?

(170) Find the weight of 1376 barrels of herrings, each 3 cwt. 1 qr. 26 lbs.

(171) What is the duty on 111 gallons 3 qts. 1½ pints of brandy at 10s. 8d. per gallon?

(172) Find the cost of 30 lbs. 11 oz. 8 drs. of opium at 18s. 6d. per lb.



- (173) Find the whole cost of  
 11 tons 5 cwt. 1 qr. salt at £5 per ton.  
 5 tons 12 cwt. 3 qrs. do. at £4. 10. 0 per ton.  
 9 tons 13 cwt. 1 qr. do. at £4. 16. 0 per ton.
- (174) What is the cost of  $3\frac{1}{2}$  tons of madder at £3. 6. 0 per cwt.?
- (175) Received payment for 11 cwt. 3 qrs. 24 lbs. of goods at the rate of £2. 16. 0 per cwt. less a commission of 2s. 6d. in the £. What sum did I receive?
- (176) What weight of hay should I get from 37 ac. 3 r. 20 poles at 2 tons 10 cwt. per acre?
- (177) What is the cost of 313 cub. yards 19 ft. 144 in. of pitch pine at 13s. 6d. per cubic yard?
- (178) Find the cost of 103 gallons 1 qt. 1 pint of rum at £1. 4. 6 per gallon.
- (179) What is the value of 14 cwt. 3 qrs. 9 lbs. of sugar at £9 per ton?
- (180) Find the cost of 103 cwt. 3 qrs. 21 lbs. of fish at 4s. 8d. per cwt.
- (181) By selling goods at a certain price I lose 9s. 4d. per cwt.; what did I lose on 8 tons 15 cwt. 27 lbs.?
- (182) What is the cost of 1136 yds 2 ft. 9 in. at 2s. 6d. per yd.?
- (183) Find the cost of 31 cwt. 3 qrs. 19 lbs. 8 oz. at £14 per ton.
- (184) What is the cost of 14 pieces of sheeting each 11 yds. 1 qr. 1 n. at 3s. 8d. per yard?
- (185) Find the cost of 11 gallons 3 qts. 1 pint of oil at 22s. 6d. per 9 gallon cask.
- (186) What is the cost of 119 tons 14 cwt. of potatoes at £82 per 10 tons?
- (187) Find the value of an estate as follows:  
 474 ac. 3 r. 20 p. grass land at £76 per acre,  
 119 ac. 1 r. 12 p. tillage at £50 per acre,  
 and 103 ac. 14 p. woodland at £40 per acre.
- (188) Find the worth of 13 cwt. 13 lbs. of tobacco at 5 guineas per quarter.
- (189) What is the cost of laying 1 m. 3 fur. 27 poles of drain-pipes at the rate of £96. 10. 0 per mile?

(190) Find the worth of 1194 cub. ft. 192 cub. in. of timber at £20 per cub. yard.

(191) What is the cost of 34 cwt. 2 qrs. 16 lbs. of soap at 18s. per cwt.?

(192) What dividend should be paid on £504. 17. 6 at the rate of 12s. 8d. in the £?

(193) Find the cost of erecting 5 fur. 13 p. 3 yds. of wire fencing at £1. 4. 6 per pole.

(194) Find the cost of glazing ten shop windows with plate glass, each window containing 3 panes 6 ft. 8 in. by 5 ft. 6 in. at 19s. 6d. per sq. foot.

(195) Find the dividend payable on £1105. 13. 4 at 3s. 4d. in the £.

(196) Bought 63 qrs. 5 bus. of wheat at £3. 3. 0 per qr.; at what price should it be sold so as to gain exactly £2. 2. 5 on the whole?

(197) What is the cost of painting the walls of a room 16 ft. long 14 ft. 6 in. broad and 8 ft. 6 in. high at 1s. 6d. a sq. yd.?

(198) What is the cost of 30 beams of timber each 37 ft. long, 1 ft. 9 in. broad and 1 ft. 9 in. thick at 2s. 6d. per cubic foot?

(199) At £230 a year what is the amount of salary for 2 years 219 days?

(200) Find the total cost of 3 oak king-posts for a roof each 18 ft. by 16 in. by 15 in. at 4s. per cub. ft.; 3 memel tie-beams 22 ft. by 20 in. by 15 in. at 3s. per cub. ft.; and 120 rafters each 21 ft. by 3 in. by 4 in. at 8d. per cub. ft.

(201) Find the cost of papering a room 119 ft. long by 31 ft. wide and 18 ft. high, with French wall-paper which is 18 inches broad, if a roll 12 yards long costs 2s. 3d.

(202) Find the rent of 126 ac. 1 r. 19½ p. at £46 per acre.

(203) What weight of mangolds should be produced by 13 ac. 3 r. 20 p. at 3 tons 5 cwt. per acre?

(204) Find the value of 20 pieces of print each 29 yds. 1 ft. 6 in. at 1s. 6d. per yard.

(205) Find by Practice the value of 1·125 ton + 714285 of a cwt. + 25 of a lb. at £35 per ton.

(206) What is the cost of varnishing inside and outside a box 4 ft. 6 in. long 3 ft. broad and 2 ft. 6 in. deep at 2d. per square foot?

- (207) Find the weight of 30 packages each 2 cwt. 1 qr. 26 lbs.
- (208) Find the cost of replacing the iron work of a bridge weighing 4796 tons at £8. 9. 6 per ton if £7 per ton be allowed for the old iron work of the bridge which weighs 303 tons 11 cwt. 3 qrs. 14 lbs.
- (209) Find the length of 143 rolls of paper for newspaper printing each 4 miles 3 fur. 140 yards long.
- (210) What would be the cost of 200 rolls of paper each 6 cwt. 1 qr. 20 lbs. at £34. 10. 0 per ton?
- (211) Find the cost of 11 qrs. 3 bus. 3 pks. of barley at 49s. per quarter.
- (212) What is the whole cost of graining 24 doors on both sides, each 7 ft. high by 3 ft. 6 in. wide, also 24 window shutters each 5 ft. 6 in. high by 4 ft. 9 in. wide, on one side only at 3d. per square foot?
- (213) What is the cost of papering the walls of a room 12 ft. long by 11 ft. broad and 9 ft. high with paper 18 inches wide at 1s. 6d. per roll of 12 yards, if a fireplace 3 ft. by 3 ft. 6 in., a window 6 ft. by 5 ft. 3 in., and two doors each 7 ft. by 3 ft. 6 in. have to be deducted?
- (214) A tenant farmer rents 303 ac. 3 r. 13 p. at £6 per acre and sub-lets 195 ac. 3 r. 20 p. at £8. 10. 0 per acre. What does he gain by the arrangement?
- (215) At what price per quarter should 1037 qrs. 3 bus. 3 pks. of oats be sold so as to gain £138. 6. 7 on the whole if the cost price was 45s. per qr.?
- (216) Find the value of 309 c. yds. 14 ft. 864 in. at £2. 1. 0 per c. yd.
- (217) Half an estate of 1020 acres was sold at £45. 7. 9 per acre,  $\frac{1}{3}$  at £42. 16. 8 per acre, and the remainder at 40 guineas per acre. What did the whole realise?
- (218) Bought 306 tons 14 cwt. 1 qr. of lime at £3. 8. 4 per ton, being allowed 2s. in the £ discount for ready money. What did I pay?
- (219) Find the cost of 103 yds. 1 qr. 1 n. 1 in. of cloth at 18s. 9d. per yard.
- (220) What is the whole cost of laying out and enclosing an estate of 4809 ac., one-half at £4. 14. 0 per ac., one-fourth the remainder at £3. 19. 0 per acre, and the rest at £7. 17. 0 per acre?

## BILLS OF PARCELS.

Make an Invoice of each of the following.

(1) London, May 13, 1876. Robt. Gray, Esq. bought of William Graham.  $5\frac{1}{2}$  lbs. cheese at  $9d.$ ;  $3\frac{3}{4}$  do. at  $8d.$ ; 16 lbs. 12 oz. bacon at  $8d.$ ;  $14\frac{1}{4}$  lbs. ham at  $11d.$ ;  $9\frac{3}{4}$  lbs. lard at  $7d.$ ; and  $8\frac{1}{2}$  dozen eggs at  $1s. 2d.$  per doz.

(2) Mr John Jameson bought of Edwin Hughes of Dublin on Jan. 11, 1870.  $3\frac{1}{2}$  lbs. tea at  $3s. 4d.$ ;  $7\frac{1}{4}$  lbs. do. at  $3s. 10d.$ ;  $1\frac{1}{2}$  stones moist sugar at  $3\frac{1}{4}d.$  per lb.;  $3\frac{1}{2}$  dozen lbs. lump do. at  $5\frac{1}{4}d.$  per lb.;  $6\frac{1}{4}$  lbs. coffee at  $1s. 8d.$ ; 9 lbs. of cocoa at  $1s. 7d.$

(3) Liverpool, Aug. 20, 1869. Mr Henry Roberts bought of George Walker. 71 lbs. soap at  $3\frac{1}{4}d.$ ;  $5\frac{1}{4}$  dozen lbs. do. at  $3\frac{1}{2}d.$ ; 5 bars yellow do. each 3 lbs. at  $4d.$ ; 18 doz. lbs. candles at  $6\frac{1}{4}d.$ ;  $13\frac{1}{2}$  qts. oil at  $6d.$  per gallon, and  $3\frac{1}{2}$  gross matches at  $5d.$  per dozen boxes.

(4) Birmingham, Jan. 11th, 1877. Mr Jas. Blackwell bought of Grayston and Co.  $3\frac{1}{4}$  yds. calico at  $6d.$ ;  $8\frac{3}{4}$  yds. do. at  $8d.$ ;  $19\frac{1}{4}$  yds. grey do. at  $9d.$ ;  $15\frac{1}{2}$  yds. flannel at  $3s.$ ;  $11\frac{3}{4}$  yds. ticking at  $2s.$ ;  $5\frac{1}{2}$  yds. linen at  $2s. 4d.$  and  $3\frac{1}{2}$  yds. fine Irish do. at  $3s. 6d.$

(5) Sydney, Aug. 4, 1873. Messrs Backhouse bought of Curtis and Co. 52 yds. Alpaca at  $1s. 7d.$ ; 3 pieces each  $29\frac{1}{2}$  yds. French merino at  $2s. 3d.$ ; 4 pieces each 156 yds. Irish poplin at  $4s. 6d.$  per yd.;  $14\frac{1}{4}$  yds. lilac silk at  $11s. 8d.$ ;  $11\frac{1}{2}$  yds. black do. at  $3s. 7\frac{1}{2}d.$ , and  $3\frac{3}{8}$  yds. satin at  $12s. 6d.$ ; package  $3s. 6d.$

(6) Mr Phillips bought of Wm. Jackson of Leeds, Feb. 9th to March 18, 1876. 13 lbs. 5 oz. beef at  $8d.$ ;  $11\frac{1}{4}$  lbs. do. at  $11d.$ ; 3 legs of mutton each 8 lbs. 8 oz. at  $9\frac{1}{2}d.$ ; 2 shoulders do. each 7 lbs. 5 oz. at  $8d.$ ; 10 lbs. 8 oz. veal at  $10\frac{1}{2}d.$ ;  $5\frac{1}{4}$  lbs. pork at  $7d.$

(7) Birmingham, Mr John Hanbury bought of Norman Reay and Co. 30 lbs. leaf tobacco at 3s. 6d.; 8 lbs. 3½ oz. Virginia do. at 4s.; 15½ lbs. Returns at 3s. 9d.; 13 boxes each 3½ lbs. cigars at 5s. 6d. per lb.; 9 boxes Havanas each 4 lbs. at 7s. 10½d. per lb. A shilling in the £ discount allowed off the amount for cash.

(8) Durham, Oct. 3rd, 1878, Long, Newton and Co. bought of Galloway and Son. 4 ankers each 10 gallons brandy at £1. 7. 9 per gal.; 15 gals. Irish Whiskey at 18s. 6d.; 11 puncheons Scotch ditto each 84 gals. at 23s.; 3 pipes of port each 126 gals. at £1. 11. 8 per gal., and 3 tierces of Hollands gin each 42 gals. at 13s. per gal.

(9) Bristol, Sept. 13, 1877, Messrs Holroyd bought of N. Rice and Co.

R. H.	No. 1,	1 Chest	Souchong	96 lbs.	tea,	tare	9 lbs.	10 oz.
	No. 2,	2 Chests	do. each	94 "	"	"	8 lbs.	11 oz.
	No. 3,	4 do.	do.	96 "	"	"	8 lbs.	10 oz.
	No. 4,	1 do.	Pekoe	94 "	"	"	9 lbs.	4 oz.
	No. 5,	4 do.	Hyson	95 "	"	"	9 lbs.	9 oz.
	No. 6.	2 do.	Gunpowder	96 "	"	"	9 lbs.	8 oz.

at 3s. per lb. average price.

(10) Mrs North bought of James Craig and Co. of London on Jan. 13th, 1875. 13¼ yds. Brussels carpet at 4s. 6d.; 18 yds. drugget at 2s. 1½d.; 5½ yds. extra wide cocoa matting at 4s. 9d.; 30 yds. binding at 1¾d.; 8½ yds. oil-cloth at 3s. 2d.; 5 door mats at 5s. 6d. each. A discount of 1s. 6d. in the £ allowed off this account for cash.

(11) Jas. Long, Esq. bought of Messrs Christie of York on July 10, 1878. 3 vols. Cowper's poems at 5s. per vol.; 3 do. Longfellow's at 3s. 6d.; 1 set of Waverley novels, 24 vols. at 8s. 6d. per vol.; 13 quires foolscap at 8½d.; 3½ reams note at 4d. per quire; 3250 envelopes at 6d. per 100; 320 penny postage stamps, 108 receipt do. and 304 half-penny stamps.

(12) Mr Wm. Gregory bought of Turner, Wrightson and Co. of Sheffield on May 9th, 1872. 13¼ lbs. cut nails at 5d.; 28 lbs. rose-headed do. at 4½d.; 6 hammers at 2s. 9d.; 6 chisels at 10½d.; 13½ gross 1 in. screws at 2½d. per doz.; 8½ gross 3 in. ditto at 5d. per doz.; 1 doz. rakes at 7½d. each; 3 spades at 4s. 6d. and 15½ lbs. of white lead at 4d.

# SIMPLE PROPORTION.

Find the fourth term of

- |      |                   |                       |  |
|------|-------------------|-----------------------|--|
| (1)  | 1 : 2 :: 3        | (19)                  | 11 : 5 :: 91                                     |
| (2)  | 4 : 5 :: 6        | (20)                  | 83 : 23 :: 249                                   |
| (3)  | 6 : 7 :: 8        | (21)                  | $1\frac{1}{2} : 6 :: 4\frac{1}{4}$               |
| (4)  | 9 : 10 :: 18      | (22)                  | $2\frac{3}{4} : 11 :: 7\frac{1}{2}$              |
| (5)  | 4 : 7 :: 6        | (23)                  | $9\frac{1}{2} : 7\frac{1}{2} :: 28\frac{1}{2}$   |
| (6)  | 3 : 9 :: 8        | (24)                  | $3\frac{1}{3} : 10 :: 51$                        |
| (7)  | 15 : 27 :: 20     | (25)                  | $9\frac{2}{3} : 6\frac{2}{3} :: 17$              |
| (8)  | 18 : 12 :: 6      | (26)                  | $5\frac{1}{2} : 6\frac{1}{4} :: 7\frac{3}{4}$    |
| (9)  | 51 : 17 :: 18     | (27)                  | $18\frac{3}{4} : 5\frac{1}{2} :: 75$             |
| (10) | 40 : 19 :: 20     | (28)                  | $5\frac{5}{8} : 10\frac{1}{11} :: 8\frac{1}{2}$  |
| (11) | 19 : 57 :: 86     | (29)                  | $12\frac{1}{4} : 14\frac{1}{4} :: 15\frac{1}{2}$ |
| (12) | 3 : 17 :: 5       | (30)                  | $15\frac{1}{3} : 12 :: 46$                       |
| (13) | 9 : 15 :: 6       | (31)                  | 1·02 : 5·1 :: 1·03                               |
| (14) | 11 : 80 :: 70     | (32)                  | 2·07 : ·051 :: ·69                               |
| (15) | 156 : 31 :: 7     | (33)                  | 17·15 : 6·32 :: 1·87                             |
| (16) | 1590 : 53 :: 1710 | (34)                  | 9·5 : 7·61 :: 14·8                               |
| (17) | 14 : 17 :: 12     | (35)                  | 11·1 : 16·38 :: 17·76                            |
| (18) | 16 : 27 :: 25     |                       |  |
|      | (36)              | £1. 10. 0             | : £1. 15. 0 :: £10                               |
|      | (37)              | £2. 6. 8              | : £2. 17. 6 :: £15                               |
|      | (38)              | £1. 5. 6              | : £2. 1. 4 :: £12                                |
|      | (39)              | 13s. $7\frac{1}{2}d.$ | : £2. 0. $10\frac{1}{2}$ :: 5s. $8\frac{1}{4}d.$ |
|      | (40)              | £2. 2. $0\frac{1}{2}$ | : £1. 0. $6\frac{1}{4}$ :: £11. 6. 0             |

- (41) As £1. 10. 6 : £2. 11. 7 :: 366 miles  
 (42) „ £5. 1. 6 $\frac{1}{4}$  : £35. 10. 7 $\frac{3}{4}$  :: 18 tons  
 (43) „ £1. 0. 4 $\frac{3}{4}$  : £11. 4. 4 $\frac{1}{4}$  :: 19 cwt.  
 (44) „ 57 miles : 38 miles :: 17 tons 13 cwt. 1 qr.  
 (45) „ 11 $\frac{1}{4}$  yards : 78 $\frac{3}{4}$  yards :: £1. 14. 0 $\frac{3}{4}$   
 (46) „ 5 dys. 3 hrs. : 61 days 12 hrs. :: £3. 16. 2  
 (47) „ 1 $\frac{3}{4}$  guineas : £10. 10. 0 :: 5 tons  
 (48) „ 18 $\frac{1}{4}$  cwts. : 7 tons 5 cwts. :: £2. 17. 6  
 (49) „ 131 horses : 1048 horses :: £462. 11. 3 $\frac{3}{4}$   
 (50) „ 11 $\frac{1}{10}$  inches : 55 $\frac{1}{2}$  yards :: 4s. 6d.  
 (51) „ 60° 37' : 360° :: 151 dys. 13 hrs.  
 (52) „ £7. 10. 11 : £90. 11. 0 :: 13 men  
 (53) „ 3 cwt. 3 qrs. : 52 tons 10 cwt. :: 30 acres  
 (54) „ 17 ac. 3 r. : 2 ac. 35 p. :: £3. 10. 0  
 (55) „ 18 bus. 3 pks. : 2116 bus. 1 pk. :: £3. 15. 0  
 (56) „ 11 tons 5 cwts. : 17 cwts. :: £15  
 (57) „ 15 $\frac{3}{4}$  yards : 1 yd. 3 qrs. 3 $\frac{1}{2}$  nls. :: £11  
 (58) „ 6 lbs. 10 oz. : 15 lbs. 11 $\frac{3}{4}$  oz. :: 8s. 10d.  
 (59) „ 5 ac. 3 r. : 38 ac. 1 r. :: £6. 10. 9 $\frac{3}{4}$   
 (60) „ 19 $\frac{3}{4}$  ac. : 11 ac. 2 r. 20 p. :: 79 tons  
 (61) If 70 lbs. of tea cost £14. 0. 0 what is that for 15 $\frac{1}{2}$  lbs.?  
 (62) Sheep are selling at £80. 10. 0 a score: what is that for 7 score and 6?  
 (63) Bought 11 lbs. 8 oz. of beef at the rate of 7s. 6d. per stone of 8 lbs.: what did it cost?  
 (64) Find the cost of 119 bushels of apples at 8 $\frac{3}{4}$ d. per peck.  
 (65) A person travels 109 miles in 36 hrs. 20 min.: in how many hours would he travel 50 miles?  
 (66) A goldsmith manufactured a piece of plate weighing 15 oz. 13 dwts. and charged £23. 4. 6: what was the rate per oz.?  
 (67) Sugar is 4 $\frac{1}{4}$ d. per lb.: what is paid for 1 $\frac{1}{2}$  cwt.?  
 (68) If 19 $\frac{3}{4}$  cwt. of coal cost £1. 3. 0 $\frac{1}{2}$ , what is that per ton?

(69) A ship brings home 69 hhds. of sugar each weighing 6 cwt. 3 qrs. 12 lbs.: what would be their whole value at £1. 8. 0 per cwt.?

(70) If 19 men earn £18. 1. 0 in a week, what would 73 men earn in a year at the same rate?

(71) The rent of 11 ac. 3 r. of land is £42; what would be the rent of 1 ac. 1 r. 35 p.?

(72) If 37 sheep produce a cwt. of wool, what would 481 produce?

(73) If 9 cwt. 3 qrs. 12 lbs. of tobacco cost £193. 4. 0, what is that for  $\frac{3}{4}$  lb.?

(74) At the rate of  $8\frac{1}{2}d.$  an hour what will a workman's wages amount to in 5 wks. 3 days, if he works 9 hours a day?

(75) Brandy is sold at £3. 18. 0 a dozen; what is that for 13 dozen and 7 bottles?

(76) If the price of a score articles exceeds the price of a dozen by 12s. 10d., what would be the price of 3 score and 10?

(77) If  $11\frac{1}{4}$  yds. of calico cost 5s.  $7\frac{1}{2}d.$ , what is the cost of 5 dozen yards?

(78) A workman digs out  $\frac{2}{3}$  of a cubic yard of earth in a quarter of an hour; if he works at a uniform rate, how long would he be occupied in excavating a cellar 5 yards square and 5 yards deep?

(79) If  $7\frac{3}{4}$  acres can be mowed in 3 days, how long would it take to mow 54 acres 1 rood?

(80) If 5 cwt. 3 qrs. 18 lbs. cost £41. 7. 6, what is that per ton?

(81) Coals are selling at £1. 8. 0 per ton, what should be paid for 11 cwt. 3 qrs.?

(82) A workman's wages for a week of 57 hours amount to £1. 14.  $5\frac{1}{4}$ ; what is that per hour?

(83) If 2 tons 10 cwt. cost £5. 14. 3; what weight may be bought for £114. 5. 0?

(84) A piece of brickwork 93 yards long is completed in 21 days; how long would it take to finish a similar piece 651 ft. long?

(85) A watch gains 10 min. 11 sec. in 24 hours; what would it gain in 6 days 12 hrs.?

(86) If 13 cwt. 1 qr. 9 lbs. of cheese cost £2. 16. 8, what would 3 cwt. 1 qr.  $9\frac{1}{4}$  lbs. cost?



(87) If a bar of iron 11 ft. long weighs 72 lbs., what would 9 similar bars each 15 ft. long weigh?

(88) Pens bought at 2s. 3d. per gross are retailed at  $4\frac{1}{2}$ d. per dozen; what is the gain on  $3\frac{1}{4}$  gross?

(89) How many dozen copy-books at  $2\frac{1}{4}$ d. each can be bought for £9. 0. 0?

(90) If  $3\frac{3}{4}$  yards cost 7s.  $2\frac{1}{4}$ d., what should be given for 103 yds.?

(91) Find the cost of  $19\frac{1}{2}$  yards of leaden piping 17 lbs. to the yard at 2s. 11d. for 5 lbs.

(92) When hay is selling at £4. 10. 0 the ton, what is the price per stone?

(93) If  $10\frac{7}{8}$  cwt. of coal cost £28, what is that for 17 cwt. 3 qrs.?

(94) If 193 men earn £203. 9. 1 in a week, what is each man's yearly wages?

(95) If 1.05 lbs. cost £1.25, what would be the price of 11.875 lbs.?

(96) If 12 bus. 1 pk. of oats cost £3. 1. 3, how many may be bought for £45. 6. 3?

(97) If 363 days' work amounts to £381. 3. 0, what is that per week of 6 days?

(98) If the rent of a field of 19 ac. 3 r. 12 p. is £40. 2. 0, what would be the rent of 5 fields each 11 ac. 2 r. 23 poles at the same rate?

(99) Bought 113 cwt. of coffee for £632. 16. 0 and sold it at 1s. 10d. per lb.; what was the total gain?

(100) How many yards of linen at 1s.  $9\frac{3}{4}$ d. may be bought for £21. 15. 0?

(101) If the first class railway fare from London to Manchester (185 miles) is £1. 18.  $6\frac{1}{2}$ , what should be paid from London to Plymouth (246 miles)?

(102) If a person's income be £210 a year, what is that for 73 days?

(103) The newspaper train leaving Euston Square at 5.15 a.m. reaches Tamworth at 9 min. to 8 (a distance of  $109\frac{1}{2}$  miles); at what rate per hour does it travel, 10 min. being allowed for stoppages?

(104) What amount of money can be raised on an assessment of £446 if the rate on £23. 10. 0 is 14s.  $8\frac{1}{4}$ d.?

(105) If 3 bus. of corn last 8 horses for a week, how many bus. would be required for 18 horses?

(106) If  $10\frac{1}{4}$  yards of cloth cost £7. 10. 0, what length can be bought for 20 guineas?

(107) If 6 men do a piece of work in 10 days, how long would it take 30 men to do the same?

(108) A machine does a certain amount of work in 12 hours at a certain rate; if its speed be accelerated  $\frac{1}{5}$  how long will it take to accomplish the work?

(109) A bankrupt pays 9s. 8d. in the £; what will be the loss on a debt of £146. 5. 0?

(110) What is the cost of 5 tons 11 cwt., if £1. 16. 6 $\frac{1}{4}$  will purchase 15 cwt. 3 qrs. 12 lbs.?

(111) If 51 ac. 3 r. 12 poles of land produce 259 qrs. 1 bus. of wheat, what would 15 ac. 1 r. 25 p. produce?

(112) The cost of iron railing is £11. 15. 0 per ton: what would be the cost of enclosing a square meadow 154 yards long if a ton of railing extends 198 feet?

(113) Find the cost of 99 bales of Esparto grass each weighing 3 cwt. 2 qrs. at the rate of £1. 10. 0 for 2 cwt. 3 qrs.

(114) If 9 $\frac{3}{8}$  lbs. cost £1. 9. 0, what will 1 $\frac{3}{4}$  lb. cost?

(115) From  $\frac{1}{2}$  of 5 cwt. 1 qr. take  $\frac{1}{3}$  of 4 cwt. 2 qrs., and find the cost of the remainder at 7s. 6d. for 1 cwt. 1 qr.

(116) If 119.025 cub. ft. of wood cost £2.56, what is that for 96.0125 cub. ft.?

(117) If 13 oxen eat a certain quantity of grass in 7 days, in what time would 91 oxen consume the same quantity?

(118) Nineteen men perform a certain piece of work in 76 days of 7 hours each; how many men would be required to do it in 133 hours?

(119) How many ounces of tobacco can be bought for 8s. 5 $\frac{1}{2}$ d. at the rate of 4s. 8d. per lb.?

(120) A gentleman pays £116. 13. 4 income-tax at the rate of 4d. in the £; what is his income?

(121) If 5 $\frac{1}{2}$  gallons of whiskey cost £5. 1. 9, what is that for 18 $\frac{3}{4}$  gallons?

(122) If the four-pound loaf costs  $8d.$  when wheat is at  $6s.$  a bushel, what would it cost when wheat is at  $7s. 6d.$ ?

(123) Find the value of 103 cwt. 3 qrs. 11 lbs. at £2. 1. 11 for 12 cwt. 3 qrs. 25 lbs. 14 oz.

(124) A bankrupt owes £23068 and his assets amt. to £1537. 17. 4; what will be the dividend in the £?

(125) If  $\frac{2}{5}$  of  $\frac{5}{8}$  of  $1\frac{1}{2}$  lbs. tea cost  $1\frac{1}{2}$  shillings, what will  $\frac{3}{4}$  of  $\frac{4}{5}$  of 2 cwt. 2 qrs. cost?

(126) A servant receives £20 a year; what should she receive from the 23rd Feb. to the 19th July?

(127) The specific gravity of rolled zinc is 7.191 (water being 1); what is the weight of a plate of zinc 18 ft. long 16 ft. broad and  $\frac{1}{8}$  in. thick if a cub. ft. of water weighs 1000 oz.?

(128) Water being 1, the specific gravity of pure molten lead is 11.3303: find the weight of a block of that metal 2 ft. 6 in. long, 2 ft. 5 in. broad and 18 in. thick.

(129) What weight of building stone would be required to complete 93 ft. of walling, if 15 tons 3 cwt. 3 qrs. be required for 8 yards?

(130) A tradesman sells  $\frac{3}{4}$  of his stock consisting of 140 cwt. of tea at  $2s.$  a lb., thereby losing £12. 10. 0. At what price per lb. must he sell the remainder so as to gain on the whole 150 guineas?

(131) A truck of coals weighing 11 tons 5 cwt. cost £8. 8. 0; what would 5 trucks each 9 tons 10 cwt. cost at the same rate?

(132) If a passage occurs on the 39th page in a book of 429 pages, where will it occur in one having 1287 pages?

(133) A merchant fails for £20,000, his assets shew cash on hand £928, ditto in bank £2300, stock £4712, good securities £1,720 and bad debts £960. What will be the dividend in the £ and the loss on £500?

(134) How many dozen pairs of gloves may be bought for  $7\frac{1}{2}$  guineas at  $3s. 6d.$  a pair?

(135) If 5 cwt. 1 qr. 27 lbs. of cheese cost £15. 7. 6, what will 9 cwt.  $22\frac{1}{2}$  lbs. cost?

(136) A bacon-factor buys 1436 hams, each  $15\frac{1}{4}$  lbs. at  $6d.$  per lb.: at what price per cwt. should he sell so as to gain £146. 8. 0 on the whole?

- (137) Divide 91 into two parts having the ratio of 5 : 8.
- (138) Bought 5 cwt. of goods and sold them so as to gain the cost price of 1 cwt. : if they were sold for £12. 15. 0 what was the cost price per ton?
- (139) Sold  $\frac{1}{2}$  of  $\frac{3}{4}$  of my goods for £4. 10. 0. If the remainder consist of 15 cwt. 3 qrs. what is the price per ton?
- (140) A coach ran from York to London (200 miles) in 33 hours 40 min., how long would it take to travel 117 miles?
- (141) A piece of work can be done in 9 hrs. 44 min. : if it be done 8 times as fast, how long will it take?
- (142) A piece of ground measuring 826.25 yards is sold for £27. 10. 10: what would be the price of 3 ac. 2 r. 11 poles?
- (143) A person walks  $\frac{1}{4}$  of his whole journey for 3 successive days and then completes it by travelling 84 miles by rail and 24 by coach. If he walked 3 miles an hour, how many hours each day did he walk?
- (144) A and B set out to walk 180 miles. A goes at the rate of 3 miles an hour, and B, who starts 10 hours later, at the rate of 4 miles an hour. Where and when will B overtake A?
- (145) If a sum of £193 gains £11. 9. 6 $\frac{1}{4}$  in 53 days, how long should £64. 6. 8 lie to gain the same amount?
- (146) What is the cost of 3 $\frac{1}{2}$  tons of pig iron at £7. 15. 0 for 1 ton 11 $\frac{1}{4}$  cwt.?
- (147) If I gain £20. 12. 6 $\frac{1}{2}$  in 73 days, what should I gain in a year and a half?
- (148) Find the value of 11 cwt. 3 qrs. 19 lbs. at £7 per ton.
- (149) A tradesman sells his debts for  $\frac{3}{4}$  of their nominal value; the buyer collects  $\frac{5}{8}$  of the debts in full and thus makes a profit of £199. 10. 0: what was the amount of the debts?
- (150) If  $\frac{3}{8}$  of  $\frac{3}{4}$  of £1 $\frac{3}{8}$  will buy 1 $\frac{1}{2}$  lbs. tea, find the cost of 5 $\frac{3}{8}$  cwt.
- (151) If the seven-penny loaf weighs 3 $\frac{1}{2}$  lbs. when wheat is at 52s. a quarter, what should it weigh when the price of wheat is 7s. per bushel?
- (152) In every 100 parts parsnips contain 82.039 water, 2.882 sugar, and 3.507 starch. What weight of each is there in 5 tons of parsnips?

(153) If Manchester including Salford has a population of three quarters of a million, and the births average 37·75 and the deaths 23·25 per thousand of the population, what will be the population ten years hence?

(154) If a person receive a salary of £250 a year, what sum may he spend in 10 wks. 3 dys. so as to lay by £57. 10. 6 besides paying 22 guineas yearly for rent?

(155) If  $16\frac{1}{3}$  oz. Troy cost £110 $\frac{1}{2}$ , what would 84 oz. cost?

(156) If 16 oxen plough a field of 110 ac. in  $11\frac{1}{2}$  days, how long will it take 80 oxen to do the same?

(157) Divide 678 into three parts such that the second shall be  $\frac{2}{3}$  of the 1st, and the last  $\frac{1}{2}$  of the 2nd.

(158) Pure gold is 24 carats fine, Standard gold 22 carats, and Jewellers' fine gold 18 carats: how many lbs. of pure gold would be required for 3 lbs. 10 oz. of Standard gold and the same weight of Jewellers' fine gold?

(159) If 153 men can do a piece of work in  $5\frac{1}{2}$  days of 8 hrs. each, how many hours would be required by 51 men to complete the same amount of work?

(160) If 17 lbs. of butter cost £1. 7.  $3\frac{1}{4}$ , what will  $\frac{1}{8}$  of  $1\frac{1}{2}$  cwt. cost?

(161) Find the cost of  $11\frac{1}{4}$  tons of nitrate of soda if 3 tons 15 cwt. cost £29. 11.  $6\frac{1}{2}$ .

(162) A gardener having  $3\frac{1}{2}$  acres of land plants it with cabbages, 8400 to the acre, for which he pays  $2\frac{1}{2}d.$  per hundred. If he sells the produce at  $8d.$  per dozen after paying £15. 10. 0 rent, what is his gain per acre?

(163) If a ship's crew of 840 men have provisions at the rate of 5 lbs. per man per day for a certain length of time, to what must the rate of allowance be reduced so as to sustain also a rescued crew of 105 men for the voyage?

(164) If 118 gallons of rum cost £21. 11. 0 and the duty is 10s.  $6d.$  per gallon, at what rate per gallon must it be sold so as to gain £34. 10. 0 on the whole?

(165) A train travels  $7\frac{1}{2}$  miles in 12·58 minutes; how far will it travel in 5 hours?

(166) Light travels 192500 miles in a second ; what is the distance of the moon if a ray of light takes  $1\cdot246753$  seconds to traverse it ?

(167) What is the amount of the wages of 11 men for 7 weeks if they earn £127. 1. 0 for  $5\frac{1}{2}$  weeks ?

(168) The English mile contains 4956·6 Paris feet, the Russian verst 3284·8 Paris feet ; how many versts are equal to 100 English miles ?

(169) If a person builds 9 houses at a cost of £113. 17. 6 each, and pays yearly for rates and taxes £20. 10. 0 and for repairs £7. 12. 6, at what rate per annum must he let each so as to gain £8. 15. 0 on each £100 of outlay ?

(170) If £150 gains £12 in 9 months, how much would £220 gain in the same time ?

(171) Find the cost of  $10\frac{1}{2}$  cwt. at 3s.  $3\frac{1}{2}d.$  for  $7\frac{9}{10}$  lbs.

(172) From 11·002 take 1·12 and find the value of the remainder at 6s. 8d. for ·0045.

(173) A gentleman leaves  $\frac{1}{3}$  of his property to each of his two sons,  $\frac{1}{3}$  to his daughter and the rest in various legacies amounting to £5400 ; if the expenses of probate amounted to £6. 7. 0 per £100, what is the net amount each of his sons and his daughter would receive ?

(174) A cubic foot of water weighs  $62\frac{1}{2}$  lbs. ; what weight would a vessel 6 in. long, wide and deep contain ?

(175) If  $3\frac{3}{4}$  tons of goods are carried 49 miles for £1. 8.  $9\frac{3}{4}$ , how far ought 26 tons 5 cwt. to be carried for the same money ?

(176) If 36 horses plough a field in  $5\frac{1}{2}$  days, how long would it take 9 horses to do the same ?

(177) The driving wheel of an engine is 18 feet in circumference and makes one complete revolution with every stroke of the piston ; how many strokes per minute will the piston make when the train is running at the rate of 45 miles an hour ?

(178) Find the cost of 156 dozen at 15s. 9d. for 3 gross.

(179) If 11·715 acres cost £141. 10. 0, what will 90·38 acres cost ?

(180) If goods are sold at a gain of £12. 10. 0 on £100 worth, what would goods costing £140 be sold for ?

(181) If  $\cdot 027$  of 111 acres cost 50 guineas, what would be paid for 8·125 acres?

(182) How many yards of carpet  $\frac{3}{4}$  yd. wide would be required for a room 18 ft. long by 13 ft. 6 in. wide? and find the cost at 19s.  $8\frac{1}{2}$ d. for  $3\frac{1}{2}$  yards.

(183) The estimated expenditure of the country is  $79\frac{1}{2}$  millions for a year; what amount should be spent from April 30th to July 25th, both days included?

(184) If  $1\frac{1}{8}$  of  $43\frac{1}{4}$  of  $\pounds 6\frac{2}{3}$  buys  $19\frac{3}{4}$  shares, what will 100 shares cost?

(185) If  $5\frac{3}{8}$  yards of linen cost  $14\frac{1}{3}$ s., how many yards may be bought for  $\pounds 5$ ?

(186) If  $1^0 20'$  measures 65 miles on a certain parallel of latitude, what will  $23^0 13' 30''$  measure?

(187) Find the cost of 17 tons 13 cwt. 3 qrs. of hay at 12s. 6d. for 1 cwt. 2 stones.

(188) Hay is selling at  $\pounds 4. 10. 0$  per ton; how much may be bought for  $\pounds 93. 10. 0$ ?

(189) If the property tax on  $\pounds 23. 5. 0$  amounts to 13s.  $6\frac{3}{4}$ d., what is that on  $\pounds 400$ ?

(190) If  $1\cdot 714285$  cwt. cost  $\pounds 1\cdot 5$ , what is the cost of 11 cwt. 3 qrs.?

(191) What is the cost of laying out a road 13 m. 3 fur. long at  $\pounds 129. 14. 0$  per mile?

(192) How long will it take to excavate a cellar 18 ft. long, 12 ft. broad and 10 ft. deep at the rate of 3 cub. yards 5 ft. in 1 hour 26 min.?

(193) How many yards of cloth can be bought for  $7\frac{1}{2}$  guineas at the rate of  $3\frac{1}{4}$  yards for 11s.  $4\frac{1}{2}$ d.?

(194) If 37 workmen do a piece of work in 15 days, how long will it take 111 men to do the same?

(195) A printing-press throws off 18000 newspapers per hour, how long will it take to print off an edition of 126000 copies?

(196) If an ordinary staff of seventeen workmen could complete a piece of work in a week (6 days), how many men must be added to complete it in 2 days?

(197) If 1000 guineas be lent for 5 weeks 3 days, how long should  $\pounds 250$  be lent in return?

(198) How many granite blocks 9 in. by  $4\frac{1}{2}$  in. on the face would be required to pave a roadway 3 fur. 109 yards long by 27 feet broad? and find their cost at £2 per ton of 160 blocks.

(199) How many reams of paper would be required to print 1000 copies of a book of 280 octavo pages?

(200) The whole rateable value of a union is £70088 and the expenses amount to £7300. 16. 8; what amount would a parish whose rateable value is £7333. 4. 0 be required to pay and what rate in the £ would furnish the necessary sum?



## COMPOUND PROPORTION.

Resolve by cancelling :—

- |      |    |                  |   |                |    |                                |   |      |
|------|----|------------------|---|----------------|----|--------------------------------|---|------|
| (1)  | As | 3                | : | 27             | :: | 40 men                         | : | Ans. |
|      |    | 15               | : | 9              |    |                                |   |      |
| (2)  |    | 11               | : | 18             | :: | 55 horses                      |   |      |
|      |    | 9                | : | 7              |    |                                |   |      |
| (3)  |    | 17               | : | 51             | :: | £13                            |   |      |
|      |    | 40               | : | 35             |    |                                |   |      |
| (4)  |    | 59               | : | 63             | :: | £120. 19. 0                    |   |      |
|      |    | 21               | : | 3              |    |                                |   |      |
| (5)  |    | $11\frac{1}{4}$  | : | $3\frac{3}{4}$ | :: | £3. 3. 0                       |   |      |
|      |    | 59               | : | 177            |    |                                |   |      |
| (6)  |    | 27               | : | 1              | :: | £33. 6. 0                      |   |      |
|      |    | 37               | : | 5              |    |                                |   |      |
| (7)  |    | $90\frac{1}{10}$ | : | 70             | :: | £946. 1. 0                     |   |      |
|      |    | 35               | : | 10             |    |                                |   |      |
| (8)  |    | 133              | : | 52             | :: | £16. 12. 6                     |   |      |
|      |    | 39               | : | 8              |    |                                |   |      |
| (9)  |    | 58               | : | 19             | :: | £30. 11. 5                     |   |      |
|      |    | 18               | : | 108            |    |                                |   |      |
|      |    | 57               | : | 5              |    |                                |   |      |
| (10) |    | $11\frac{1}{4}$  | : | 90             | :: | 5 cwt. 3 qrs.                  |   |      |
|      |    | 46               | : | 12             |    |                                |   |      |
|      |    | 9                | : | $2\frac{1}{2}$ |    |                                |   |      |
| (11) |    | $18\frac{3}{4}$  | : | 49             | :: | 3 lbs. $5\frac{2}{3}$ oz. Troy |   |      |
|      |    | 28               | : | 43             |    |                                |   |      |

- (12) As 53 : 22 :: 35 yds. 1 ft.  
 $1\frac{1}{10}$  : 2  
 $1\frac{3}{7}$  : 7
- (13) 15·8 : 1·975 :: £2. 3.  $1\frac{1}{4}$   
 ·076 : 6·08  
 10 : 4
- (14) 25 : 1110 :: 580 days  
 37 : 3  
 696 : 15
- (15) 5 : 17 :: 19 cwt.  
 7 : 8  
 85 : 25
- (16)  $3\frac{3}{5}$  : 36 :: 4 cwt.  
 30 : 72  
 $1\frac{2}{3}$  : 3
- (17)  $11\frac{1}{3}$  :  $20\frac{2}{5}$  :: 7 lbs. 5 oz. 3 drs.  
 9 : 55  
 11 : 18
- (18) 3·27 : 4·5 :: £1. 1.  $9\frac{3}{5}$   
 $1\frac{1}{12}$  : 46
- (19) 558 : 527 :: £1. 16. 0  
 51 : 9
- (20) 18 cwt. 3 qrs. : 5 tons :: £78. 15. 0  
 $6\frac{1}{3}$  :  $14\frac{1}{4}$
- (21) 2 lbs. 15 drs. : 2 lbs. 2 oz. 14 drs. :: £3. 9. 5  
 36 : 7·2
- (22) 4 fur. 185 yds. : 5 fur. 36 yds. :: 30 guineas  
 56·8 : 53·25
- (23) 13 : 24 :: 52 weeks  
 36 : 73  
 365 :  $10\frac{1}{2}$
- (24)  $17\frac{1}{3}$  : 30 :: 104 oz.  
 6 : 7  
 210 : 110
- (25) 26·875 : 37·25 :: 1 ton 3 cwt. 3 qrs.  $27\frac{1}{2}$  lbs.  
 1·02 : ·204

- (26) As  $1\frac{3}{8} : 5 :: 1 \text{ yr. } 219 \text{ dys.}$   
 $5\frac{3}{8} : 9$
- (27)  $57 : 18 :: 133 \text{ bushels}$   
 $7 : 3$   
 $5\frac{3}{8} : 5$
- (28)  $\text{£}1. 9. 2. : 2s. 6d. :: \text{£}11. 13. 4$   
 $210 : 84$   
 $3 : 5$
- (29)  $54 \text{ tons} : 17 \text{ cwt. } 16 \text{ lbs.} :: 111 \text{ miles}$   
 $37 : 999$   
 $27 : 63$
- (30)  $5 \text{ cwt. } 27 \text{ lbs. } 8 \text{ oz.} : 30\frac{1}{3} \text{ oz.} :: \text{£}15$   
 $12\frac{1}{2} : 11\cdot25$   
 $45 : 2\frac{1}{2}$   
 $6\frac{1}{2} : 1410$

(31) If £500 gains £11. 10. 0 in 7 months, what will £300 gain in  $10\frac{1}{2}$  months?

(32) If 31 bushels of oats last 112 horses for 3 days, how many bushels will last 560 horses a fortnight?

(33) What sum should be placed out for 9 months to gain £45 if £560 gains £14 in 5 months?

(34) If 13 men can do a piece of work in 9 days of 7 hours each, how many hours a day must 91 men work to complete it in one day?

(35) If 5 pecks of flour last a family of 9 persons seven days, how long ought 7 bushels last 18 persons?

(36) If 9 men earn £11. 10. 5 in 5 days of 7 hours each, how much ought 113 men earn in 18 days of 8 hours each?

(37) If 35 tons be carried 90 miles for  $12\frac{1}{2}$  guineas, for what sum ought 4 tons 7 cwt. 2 qrs. be carried 200 miles?

(38) If 145 bushels of turnips be consumed by 53 oxen in a fortnight, how long would 435 bushels suffice for 371 oxen?

(39) A person travels 110 miles in 7 days walking 4 hours each day, how many days would he require to go 400 miles walking 6 hours a day at the same rate?

(40) If 17 men earn £24 in 8 days, how many days must 102 men work to earn 120 guineas?

(41) If 5 men can reap 11 acres of oats in 9 days, how long would 18 men require to reap 44 acres at the same rate?

(42) If  $11\frac{1}{4}$  yds. of carpet  $1\frac{1}{4}$  yds. wide cost £8, what would 90 yards each  $22\frac{1}{2}$  inches wide cost?

(43) *A* lends *B* £400 for 15 months at 4 per cent., how long in return ought *B* lend *A* £1500 at 3 per cent.?

(44) If £210 be required to maintain 117 persons for a fortnight, what sum would be required to maintain 26 persons during the months of July and August?

(45) Find the weight of 12 blocks of marble each 9 ft. 6 in. long, 7 ft. 6 in. broad and 3 ft. thick, if 5 blocks each 5 ft. 8 in. long, 3 ft. 9 in. broad and 2 ft. thick weigh  $59\frac{1}{2}$  tons.

(46) If 50 gallons of spirits of proof strength cost £40, what ought 90 gallons 20 per cent. above proof cost?

(47) If 50 yards of cloth three quarters of a yard wide be bought for £23. 10. 0, find the cost of  $12\frac{1}{2}$  yds. each  $\frac{2}{3}$  of a yard wide.

(48) If 100 men do a piece of work in 18 days working at a certain rate, how many days would 150 men require to do 5 times as much working at one half the rate?

(49) If the shilling loaf weighs 6 lbs. when wheat is at 60s. the quarter, what ought the ninepenny loaf weigh when wheat is at 6s. 9d. per bushel?

(50) A locomotive making 162 strokes per minute travels 90 miles in 2 hours, how many strokes per minute must the same engine make to travel 200 miles in  $4\frac{1}{2}$  hours?

(51) If 3 compositors working  $10\frac{1}{2}$  hours a day set up 20 columns of type, each 150 lines, in  $2\frac{1}{2}$  days, how many days of 7 hours long would be required by 12 compositors to set up 15 columns, each 180 lines, of the same type?

(52) A town is garrisoned with 50000 troops and has provisions sufficient for that number for  $3\frac{1}{2}$  months, allowing a ration of 2 lbs. daily to each man; how many must be sent away so that by giving an additional  $\frac{1}{2}$  lb. to each man the provisions may last 14 months?

(53) If 13 men dig a trench 19 yds. long, 5 ft. broad and 8 ft. deep in 14 days of 6 hours each, how many days of 8 hours long would be required by 91 men to dig a trench 64 yds. long by 19 ft. wide and 5 yds. deep?

(54) If 3 men, 5 women or 8 boys can weed 18 acres in 9 days, how long would it take 5 men 8 women and 3 boys to weed 109 ac. 1 r.?

(55) If  $\frac{5}{7}$  of a cargo valued at £15000 be insured for £10500, what should  $\frac{1}{8}$  of a cargo worth £20000 be insured for, so that in case of loss a proportionate amount may be recovered?

(56) When wheat is at 12s. 6d. the boll (2 bushels) the sixpenny loaf weighs  $3\frac{1}{2}$  lbs.; what should be the weight of the fourpenny loaf when wheat is selling at 64s. the quarter?

(57) If 5 men or 12 boys can do a certain piece of work in 9 days of 7 hours each, how long would it take 15 men and 8 boys to do 3 times as much, working 8 hours per day?

(58) If £400 gain £30. 12. 0 in 6 months, in what length of time would £900 gain £25. 10. 0?

(59) If 18 masons build a wall 30 yds. long, 2 ft. 3 in. thick, and 10 ft. high in 6 days, how many masons would be required to build a wall 144 ft. long, 5 ft. high and 3 ft. thick in 16 days, supposing that 10 of the latter men be equal to 9 of the former?

(60) How many men of ordinary ability working 6 hours a day for 17 days would be able to do 3 times as much work as 14 men working 8 hours a day for  $8\frac{1}{2}$  days, if the abilities of the latter be  $\frac{5}{7}$  of the others?

(61) If  $\frac{3\frac{1}{3} \text{ of } 11\frac{1}{2}}{13\frac{1}{2}}$  of £2 $\frac{8}{25}$  will purchase  $\frac{3}{8}$  of  $\frac{2}{9}$  of 192 yards of steel rails weighing 70 lbs. per yard, what should be the weight per yard of

2 fur. 120 yds. of the same quality of rails which cost  $\text{£} \frac{11\frac{1}{2} \div \frac{1}{8}}{7 \div \frac{1}{17}} \frac{1}{810}$ ?

(62) If .3 per cent. of a certain company's capital amounts to £75, and the whole capital is .5 of the combined capitals of three other companies whose respective amounts are in the ratio to one another of 3, 5, and 7; find the ratio of the capital of each of these companies to that of the first-mentioned company.

(63) If 3 lbs. of sugar cost as much as 5 lbs. of rice, and 7 lbs. rice be equivalent to 4 lbs. currants, and 9 lbs. currants equivalent to 1 lb. 5 oz. tea; what is the cost of sugar per cwt. when tea is 3s. per lb.?

## PER CENTAGES.

(1) An article bought for 25*s.* is sold for 27*s.* 6*d.*, what is the gain per cent.?

(2) Find the gain per cent. on an article which cost 5*s.* 6*d.* and was sold for 6*s.* 5*d.*

(3) Buying sugar at £1. 17. 4 per cwt. and selling it at 4½*d.* per lb., what do I gain per cent.?

(4) Sold goods at £4. 19. 0 thus gaining 10 per cent., find the cost price.

(5) If I gain three half-pence in a shilling, what do I gain per cent.?

(6) The prime cost of goods is £3. 15. 0, for what must they be sold so as to gain 15½ per cent.?

(7) Wheat is selling at 54*s.* the quarter wholesale, but is retailed at an advance of 12½ per cent.; what is the price per bushel at the latter rate?

(8) A tradesman marks his goods 25 per cent. above cash price; what cash will he take for an article marked at 13*s.* 0½*d.*?

(9) If by selling at 7*s.* 11½*d.* per yard I lose 4½ per cent., at what price ought I to sell to gain 15 per cent.?

(10) What was the selling price of 30 yards of cloth which was sold at an advance of 20 per cent. on the original cost, 4*s.* 7*d.* per yard?

(11) A man earning 45*s.* weekly obtains an advance of 10 per cent., what is his present rate of wages?

(12) Sold 320 yards of serge for £44. 12. 6 which had cost 2*s.* 7½*d.* per yard; find the total gain and the gain per cent.

(13) Bought eggs at 16 for a shilling and sold them 13 for a shilling; what is my gain per cent.?

(14) Bought 176 yds. of ribbon at a certain price, and sold the whole for £8. 5. 0, thus gaining  $12\frac{1}{2}$  per cent.; find the cost price per yard.

(15) For what must an article which cost 9s.  $4\frac{1}{2}d.$  be sold so as to gain 16 per cent.?

(16) Iron bars were selling at £9. 5. 10 per ton, but sellers offered them at 10 per cent. less for cash; what was the cash price?

(17) A merchant sells 95 bags of rice for £35. 12. 6, thus gaining  $12\frac{1}{2}$  per cent.; what was the prime cost per bag?

(18) By selling sherry at 45s. a dozen which cost me half-a-crown a bottle, what is my gain per cent.?

(19) Out of a cargo of 96 tons 3 cwt. of fish which cost 7s.  $6d.$  per cwt. 5 per cent. was unfit for sale. At what rate per cwt. should the remainder be sold so as to gain 20 per cent. on the whole?

(20) Bought oranges at the rate of 3 for a penny; how many should be sold for  $5d.$  to gain  $6\frac{2}{3}$  per cent.?

(21) Find the prime cost of soap per cwt. which is selling for £1. 12.  $9\frac{3}{4}$  at a gain of  $31\frac{1}{4}$  per cent.

(22) A retail dealer sells an article for £5. 16.  $10\frac{1}{2}$ , at an advance of  $6\frac{1}{4}$  per cent. on the wholesale price which is 10 per cent. gain on the manufacturer's price; what was the prime cost?

(23) The prime cost of 36 cwt. of cheese is £134. 8. 0; at what price per lb. must it be sold so as to gain  $3\frac{1}{8}$  per cent.?

(24) Sold 58 tons 13 cwt. of oil cake for £615. 16. 6 thereby gaining 5 per cent.; what was the prime cost per ton?

(25) A fruiterer bought oranges at 1s. a score and sold them at 1s. a dozen; what was his gain per cent.?

(26) What is the loss per cent. by selling 38 yards of merino for £7. 2. 6 which cost 4s.  $2d.$  a yard?

(27) By selling eggs at 15 for 1s. I gain 6 times as much per cent. as I should had I sold them at 20 a shilling. Find the prime cost of 125 dozen.

(28) What is the brokerage upon £447. 10. 0 at  $\frac{1}{8}$  per cent.?

(29) A commission of 5 per cent. is charged by an agent on an account of £20. 11. 8; what sum does he pay to his employer?

(30) A vessel worth £37500 is insured at  $6\frac{3}{4}$  per cent.; what is the premium paid?

(31) A vessel worth £39500 is insured for  $67\frac{1}{2}$  per cent. of its value. What loss would the owners sustain in case of wreck?

(32) What ready-money payment will settle a bill of £43. 17. 6, discount being allowed at the rate of 5 per cent.?

(33) A ton of cannel coal costing 18s. 6d. gives off 40 per cent. more gas than ordinary coal, what price per ton should be paid for the latter for gas making?

(34) For how much should a tradesman's stock worth £5122 be insured at  $2\frac{1}{2}$  per cent., so that in case of loss the value of the stock and the amount of premium may be recovered?

(35) What is the commission on £374. 8. 6 at  $12\frac{1}{2}$  per cent.?

(36) A person paid £18. 15. 3 after being allowed 5 per cent. for cash; what was the amount of his bill?

(37) If £3. 6. 8 per cent. be charged as premium on a policy of insurance for a certain age, what would be the yearly premium on a policy of £459. 17. 6?

(38) A bankrupt's assets are 36 per cent. of his liabilities, what would a creditor for £510 lose supposing legal expenses to absorb 10 per cent. of the assets?

(39) For what sum should a cargo worth £9254. 12. 6 be insured at  $7\frac{1}{2}$  per cent., so that in case of loss the value of the cargo and the premium paid may be recovered?

(40) Find the ready-money payment of a bill of £3. 7. 6, discount being allowed at the rate of 25 per cent.

(41) If I pay £7. 6. 0 in settlement of an account after an allowance of 4 per cent. discount has been made, what was the original amount of the bill?

(42) By selling for 11s. a bushel what cost me 74s. 8d. a quarter, what do I gain per cent.?

(43) If I buy at 30 a shilling and sell at 9d. per dozen, what is my gain per cent. and my whole gain on 60 dozen?



(44) Paid £10. 18. 9 premium on a policy of insurance at the rate of  $3\frac{1}{8}$  per cent., what sum is assured?

(45) What is the commission on £47. 10. 10 at 5 per cent.?

(46) What would be the ready-money payment of an account of £30. 12. 0, discount being at  $8\frac{1}{3}$  per cent.?

(47) What is the brokerage on £715. 15. 0 at half-a-crown per cent.?

(48) Goods are insured above their real value for £400 at  $4\frac{1}{2}$  per cent. so that in case of loss their real value and the premium may be recovered; what is their real value?

(49) Find the brokerage on £4700 at 3s. 4d. per cent.

(50) Sold half my goods at double their value, and the rest at half their value thereby gaining £52. 10. 0; what did I receive for them?

## SIMPLE INTEREST.

Find the Simple Interest of

(1)	£200	for	3	years at	4	per cent.	per annum.
(2)	£250	„	5	„	3	„	„
(3)	£175	„	4	„	4	„	„
(4)	£260	„	6	„	4	„	„
(5)	£195	„	4	„	3	„	„
(6)	£1150	„	4	„	5	„	„
(7)	£920	„	$2\frac{1}{2}$	„	5	„	„
(8)	£180	„	$3\frac{1}{4}$	„	4	„	„
(9)	£500	„	$4\frac{3}{4}$	„	$3\frac{1}{2}$	„	„
(10)	£290	„	$11\frac{1}{2}$	„	$2\frac{1}{4}$	„	„
(11)	£516	„	$12\frac{1}{2}$	„	8	„	„
(12)	£420. 10. 0	„	$5\frac{1}{2}$	„	$3\frac{1}{2}$	„	„
(13)	£510. 12. 6	„	4	„	4	„	„
(14)	£920. 18. 0	„	20	„	$2\frac{1}{2}$	„	„
(15)	£144	„	$1\frac{3}{8}$	„	$1\frac{1}{5}$	„	„
(16)	£249. 18. 4	„	$11\frac{1}{4}$	„	7	„	„
(17)	£909. 19. 9	„	$7\frac{5}{8}$	„	$2\frac{1}{3}$	„	„
(18)	£400	„	$6\frac{11}{12}$	„	$3\frac{3}{8}$	„	„
(19)	£124. 15. 6	„	$3\frac{3}{8}$	„	$3\frac{5}{8}$	„	„
(20)	£750	„	$19\frac{3}{5}$	„	$4\frac{1}{4}$	„	„
(21)	£302. 12. 6	„	$4\frac{1}{5}$	„	$2\frac{3}{4}$	„	„
(22)	£1250	„	$9\frac{1}{8}$	„	$1\frac{2}{3}$	„	„

- (23) £7002. 16. 0 for  $51\frac{1}{4}$  years at  $2\frac{3}{4}$  per cent. per annum.
- (24) £1100. 0. 0 "  $13\frac{3}{11}$  " "  $6\frac{3}{8}$  " "
- (25) £205.25 " 18.375 " " 5.75 " "
- (26) £1900.875 " 6.125 " " 4.45 " "
- (27) £280.14 " 5.19 " " 3.86 " "
- (28) £150. 10. 0 " 3yrs. 3mths. "  $3\frac{3}{4}$  " "
- (29) £125 $\frac{5}{8}$  " 9yrs. 10mths.  $7\frac{1}{2}$  " "
- (30) £3000 " 1yr. 11mths. "  $1\frac{9}{10}$  " "
- (31) Find the amount on £430 for 11 years 3 mths. at 2 per cent.
- (32) Find the Simple Interest of £720 for 5 yrs. 7 mths. at  $3\frac{1}{2}$  per cent.
- (33) Find the amount on £140. 12. 6 placed out at Simple Interest for 6 yrs. 73 days at 4 per cent.
- (34) In what time will £44. 11. 9 $\frac{3}{4}$  double itself at  $4\frac{1}{2}$  per cent. yearly?
- (35) What is the Simple Interest of £150. 17. 8 for 2 yrs. 146 days at £3. 10. 0 per cent. yearly?
- (36) At £1. 17. 6 per cent. per annum, what would £400. 4. 0 amount to in 15 years?
- (37) At 4 per cent. Simple Interest, what would £230. 12. 6 amount to in 7 yrs. 219 days?
- (38) In what time will £6060 amount to £6696. 6. 0 at 3 per cent. per annum?
- (39) At what rate per cent. will £490. 12. 6 amount to £686. 17. 6 in 8 years?
- (40) At what rate per cent. will £500 amount to £562. 10. 0 in 4 years?
- (41) Find the Simple Interest on £476. 13. 9 $\frac{1}{2}$  for 5 yrs. 11 mths. at  $3\frac{1}{2}$  per cent.
- (42) What sum will produce £62. 10. 0 Simple Interest in 5 years at  $2\frac{1}{2}$  per cent. per annum?
- (43) What sum will produce £106. 13. 4 Simple Interest in 4 years at  $3\frac{1}{2}$  per cent.?

(44) What is the Simple Interest on £360 from Jan. 30 to Dec. 30 of 1868 at  $3\frac{1}{4}$  per cent.?

(45) Find the Simple Interest on £1100 from Jan. 6, 1865 to June 19, 1871 at 5 per cent. per annum.

(46) What sum placed out at Simple Interest for  $7\frac{1}{4}$  years at  $3\frac{1}{2}$  per cent. will produce £101. 10. 0 interest?

(47) Find the Simple Interest of £90.35 for .58 year at 3.025 per cent.

(48) In what time will £1075 amount to £1200 at 5 per cent. per annum Simple Interest?

(49) In how many years will £1030. 12. 11 double itself if placed out at  $2\frac{1}{2}$  per cent. Simple Interest?

(50) At what rate per cent. will £301. 12. 6 amount in 5 years to £346. 17.  $4\frac{1}{2}$ ?

(51) At what rate per cent. will £90 amount to £111. 9. 0 in  $3\frac{1}{4}$  years?

(52) Find the Simple Interest on £440 for 11 yrs. 5 mths. at £4. 10. 0 per cent.

(53) What sum placed out at Simple Interest will produce £86.12.6 in  $3\frac{1}{2}$  years at  $2\frac{1}{4}$  per cent. yearly?

(54) In how many years will £474 produce £59. 5. 0 at 2 per cent.?

(55) At what rate per cent. will £105700 amount to £116270 in 10 years?

(56) Find the Simple Interest on £26. 10. 0 for  $3\frac{1}{4}$  years at  $1\frac{1}{2}$  per cent. monthly.

(57) Find the Simple Interest on £730. 10. 6 for  $8\frac{1}{4}$  years at  $2\frac{1}{4}$  per cent.

(58) At  $\frac{3}{8}$  per cent. monthly, find the Simple Interest on £25 for 1 year 11 months.

(59) Find the Simple Interest on £4000 from Jan. 11, 1873 to July 8, 1875 at  $3\frac{1}{4}$  per cent.

(60) Find the Simple Interest on £7050 from Oct. 30, 1843 to Jan. 3, 1876 at 5 per cent. taking account of Leap years.

(61) Find the Simple Interest on £4700 from Nov. 11 to Dec. 7 of the same year at  $\frac{5}{8}$  per cent. per month.

(62) At what rate per cent. will £5000 amount to £5400 in 1 year 219 days?

(63) Find the amount of £300·275 placed out at Simple Interest for 3·758 years at 2·125 per cent.

(64) In what time will £370 gain £123. 6. 8 at  $3\frac{1}{4}$  per cent. per annum?

(65) Find the amount of Interest to be paid on £200 for 11 mths., £250 for 9 mths., and £300 for 6 mths., at 5 per cent. per annum.

## COMPOUND INTEREST.

Find the Compound Interest on

(1)	£400	for 2	years at	3	per cent. per annum.
(2)	£560	„ 3	„	$3\frac{1}{2}$	„ „
(3)	£800	„ 4	„	$4\frac{1}{4}$	„ „
(4)	£926	„ 5	„	5	„ „
(5)	£720	„ 6	„	4	„ „
(6)	£814	„ 11	„	6	„ „
(7)	£964	„ 5	„	3	„ „
(8)	£1796	„ $8\frac{1}{2}$	„	4	„ half-yearly
(9)	£1900	„ $5\frac{1}{2}$	„	6	„ „
(10)	£4702	„ $16\frac{1}{2}$	„	5	„ „
(11)	£41951	„ 22	„	4	„ „
(12)	£1400	„ $3\frac{1}{4}$	„	5	„ quarterly
(13)	£925	„ $2\frac{1}{2}$	„	4	„ „
(14)	£1726	„ $3\frac{3}{4}$	„	5	„ „
(15)	£8021	„ $2\frac{3}{4}$	„	6	„ „
(16)	£70211	„ $8\frac{3}{4}$	„	4	„ „
(17)	£832	„ $1\frac{3}{4}$	„	3	„ „
(18)	£4280	„ $1\frac{1}{2}$	„	3	„ „
(19)	£3021	„ $4\frac{1}{4}$	„	3	„ „
(20)	£5060	„ $3\frac{1}{2}$	„	4	„ „

(21) Find the amount of £305. 7. 6 for 7 years at 4 per cent. Compound Interest.

(22) How much money put out to Compound Interest for 3 years at 5 per cent. will amount to £1157. 12. 6?

(23) Find the amount of £509 for  $5\frac{1}{4}$  years at 3 per cent. quarterly.

(24) Find the difference between the Simple and Compound Interest on £200 for 3 years at 2 per cent.

(25) At what rate per cent. Compound Interest will £500 amount to £595. 10.  $1\frac{2}{3}$  in 3 years?

(26) Find the Compound Interest on £225 for 5 years at 4 per cent.

(27) What will £140 amount to in  $2\frac{1}{4}$  years at 2 per cent. quarterly?

(28) What is the Compound Interest of £203 for  $5\frac{1}{2}$  years at 4 per cent. half yearly?

(29) Find the amount on £4009 for  $3\frac{1}{4}$  years at 3 per cent. quarterly.

(30) Find the Compound Interest of £302. 12. 6 for 7 years at 3 per cent. per annum.

(31) In how many years will £1000 amount to £1124. 17.  $3\frac{2}{5}$  at 4 per cent. per annum?

(32) What sum will amount to £12155. 1. 3 in 4 years at 5 per cent. Compound Interest?

## DISCOUNT.

(1) Find the present worth of £4081 due in 5 years reckoning discount at 2 per cent.

(2) What is the present worth of £559. 7. 0 due in  $2\frac{1}{2}$  years discount being at 5 per cent.?

(3) Find the present value of £1213. 6. 0 due in 4 years discount at  $2\frac{1}{2}$  per cent.

(4) What is the present worth of £793. 7. 6 due in 3 years 4 months at 3 per cent. discount.?

(5) What sum paid now would satisfy a bill of £1650 due in  $1\frac{1}{4}$  years at  $2\frac{1}{2}$  per cent.?

(6) What is the true discount on a bill of £1608. 0. 0 due in  $11\frac{1}{3}$  years at 3 per cent.?

(7) Find the present worth of £322. 7. 0 due in 8 months at  $3\frac{1}{2}$  per cent.

(8) What is the present worth of a bill of £81. 3. 5 due in 5 mths. discount at  $1\frac{1}{2}$  per cent.?

(9) Find the true discount on £733. 4. 0 due in 1 year 4 months at 3 per cent.

(10) What sum of money paid at the beginning of the year would be equivalent to a salary of £336. 3. 0 per annum paid quarterly, allowing discount at the rate of 5 per cent. per annum?

(11) Find the difference between Banker's and True Discount on a bill of £209 due in 18 months at 3 per cent.

(12) Find the ordinary discount on a bill of £110. 10. 0 due in 2 yrs. 6 mths. at 4 per cent.



Find the Ordinary or Banker's discount upon the following bills :

	Amount		When drawn	Term	When Discounted	Rate of Discount
(13)	£1095 0 0		Jan. 12, 1870	3 mths.	Feb. 14	5 per cent.
(14)	£584 0 0		Oct. 3	1 mth.	Oct. 12	4 „
(15)	£730 0 0		Feb. 11, 1871	6 mths.	Feb. 19	5 „
(16)	£4380 0 0		Jan. 1, 1867	6 mths.	June 3	5 „
(17)	£1485 0 0		Jan. 10, 1843	2 mths.	Mar. 3	2½ „
(18)	£383 5 0		Aug. 5, 1876	3 mths.	Sep. 10	3 „
(19)	£182 10 0		July 14, 1878	6 mths.	Oct. 5	4½ „
(20)	£4573 2 11		Dec. 4, 1877	60 days	Jan. 5, 1878	3½ „

Find the true discount upon

(21)	£368 8 0	Sep. 9, 1874	3 mths.	Oct. 5, 1874	5 „
(22)	£167 14 1	Oct. 3, 1875	60 days	Nov. 5, 1875	3 „
(23)	£1220 2 8	Mar. 11, 1876	30 days	Mar. 18, 1876	4 „
(24)	£297 7 6	Mar. 9, 1878	2 mths.	Apr. 12, 1878	3½ „
(25)	£2797 18 3	Aug. 11, 1877	8 mths.	Oct. 17, 1877	4½ „
(26)	£609 9 2	Sep. 5, 1869	3 mths.	Nov. 11, 1869	2½ „
(27)	£126 5 0	Mar. 9, 1878	5 mths.	May 31, 1878	5 „
(28)	£1105 10 1	May 10, 1871	60 days	June 3, 1871	4 „
(29)	£2286 13 9	Nov. 3	1 mth.	Nov. 7	3 „
(30)	£68 11 4½	Aug. 9	3 mths.	Oct. 15	2½ „

## STOCKS.

(1) When the  $3\frac{1}{2}$  per cents. are at 92, what money must I invest to receive an income of £175?

(2) If I invest £3694. 10. 0 in the 3 per cents. at 90, what income should I derive?

(3) A person places 1000 guineas in the 3 per cents. at 90, and a like sum in the  $3\frac{1}{2}$  per cents. at 95. What does he receive from one investment more than from the other?

(4) In which is it most advantageous to invest, the  $3\frac{1}{2}$  per cents. being at 92, and the 4 per cents. at 95?

(5) The shares of a Company originally issued at 100 have depreciated 15 per cent. and bear interest at 4 per cent.; the preference shares of the same Company bearing interest at 6 per cent. are at 20 per cent. premium. How much would an income be decreased by transferring £1530 stock from the preference to the ordinary shares?

(6) A person invested £1112. 10 in the  $3\frac{1}{2}$  per cents. at 89, and on their rising to  $90\frac{7}{8}$  sold out; what did he gain?

(7) The dividend on the shares of a Company is at the rate of 8 per cent. per annum; had the profits been £450 more, a dividend of  $8\frac{1}{2}$  per cent. could have been declared: what is the share capital?

(8) Find the income arising from the investment of £996. 17. 6 in the  $3\frac{1}{2}$  per cents. at  $90\frac{5}{8}$ .

(9) A person lays out £5000 in the 3 per cents. at 75 and afterwards transfers to the 4 per cents. at 80; what is the difference of income?

(10) After investing £8750 in the 3 per cents. at  $87\frac{1}{2}$  I sell out on a rise of  $\frac{1}{2}$  per cent., investing what I realize in  $2\frac{1}{2}$  per cent. railway stock at 44. What is the increase in my income?

(11) The 3 per cents. at 90 decline to 88 $\frac{3}{4}$ . What does a person lose who has invested £4500 at the former price and sells at the latter?

(12) A person has an income of £311. 10. 0 from the 3 $\frac{1}{2}$  per cents. which he purchased at 91. What sum did he invest?

(13) A person invests £6330 in the 4 per cents. at 79 $\frac{1}{8}$ , and after receiving a year's dividend sells out, investing both stock and profit in the 3 $\frac{1}{2}$  per cents. at 66 $\frac{1}{2}$ . What is the increase in his income?

(14) If I sell out £19100 stock at 84 $\frac{3}{8}$ , and invest the proceeds in the 4 per cents. at 95 $\frac{1}{2}$ , what income do I thence derive?

(15) A person places £1000 out at Compound Interest for 3 years at 5 per cent., and with £1000 more purchases 3 per cent. stock at 92 $\frac{1}{2}$  which he holds for the same period, and then sells out at 95. What is his total increase of capital?

(16) Which offers the highest rate of interest, the 3 $\frac{1}{2}$  per cents. at 73 $\frac{1}{2}$ , or the 4 per cents. at 85?

(17) A has £1750 in the 4 per cents. at 87 $\frac{1}{2}$ . What sum must B have in the 3 $\frac{1}{2}$  per cents. at 77 to yield him an equal amount of interest?

(18) A person has invested £1092 in the 3 $\frac{1}{2}$  per cents. at 78, and after receiving a year's dividend sells out at 83, and places the proceeds out at Simple Interest for 2 $\frac{1}{2}$  years at 4 per cent. What is his total increase of capital at the end of that time?

(19) If £1150 stock be sold out of the 3 per cents. at 72, and £5400 stock out of the 3 $\frac{1}{2}$  per cents. at 83, and the proceeds be invested in the 4 per cents. at 88 $\frac{1}{2}$ , what is the difference of income?

(20) A person lays out a certain sum in the 3 per cents. at 85, and £4860 in the 4 per cents. at 90; his yearly income from these sources is £426. What amount does he invest in the 3 per cents.?

## PROPORTIONAL PARTS.

- (1) Divide 738 into three parts having the ratio of  $\frac{1}{2}$ ,  $\frac{1}{3}$  and  $\frac{1}{6}$ .
- (2) Divide 540 into four parts having the ratio of 8, 5, 7, 10.
- (3) Divide 52 into three parts so that the first may be  $\frac{1}{3}$  of the second, and the third  $\frac{1}{2}$  of the second and first together.
- (4) Divide 123·21 into three parts having the ratio of 11·1, 1·11 and ·111.
- (5) Standard gold is  $\frac{11}{12}$  fine. If a sovereign weighs 123 grains, find the weight of pure gold in 360 sovereigns.
- (6) Divide 93 into two parts so that  $\frac{3}{4}$  of the one may be equal to  $\frac{4}{5}$  of the other.
- (7) Divide 126 into parts having the ratio of 2, 7 and 9; and also into parts having the ratio of  $\frac{1}{2}$ ,  $\frac{1}{3}$  and  $\frac{1}{6}$ .
- (8) If jewellers' fine gold be 18 carats fine, how much pure gold is there in a piece of plate weighing 33 lbs.? and find its value if a sovereign be 22 carats fine and weighs 123 grains.
- (9) In every 100 parts of ashes of wheat there is, potash 15 parts, phosphate of lime 32, chloride of potassium 0·16, earthy phosphates 44·5, silica 0·5, metallic oxides 0·25, and there is a loss of 7·59. Find the weight of each in a ton of wheat.
- (10) Divide 644 into two parts, so that  $\frac{8}{9}$  of the one may be equal to  $\frac{9}{10}$  of the other.
- (11) Divide 720 into three parts, so that the first multiplied by 4, the second by 5, and the third by 6 give the same product.
- (12) Sea-water contains by weight 2·65 per cent. of chloride of sodium, ·46 per cent. of sulphate of soda, and ·51 of chloride of magnesium. Find the weight of each in 50 tons of sea-water.

(13) Divide £520 amongst four persons, so that their shares shall be in the ratio  $1\frac{1}{2}$ ,  $2\frac{1}{2}$ , 4, and 5.

(14) Pure gold is mixed with copper to make standard gold which is 22 carats fine. Find the weight of copper contained in 400 sovereigns, each weighing 120 grains Troy.

(15) One half of *A*'s money is in notes,  $\frac{1}{3}$  in gold,  $\frac{1}{3}$  in silver, and the remainder, £5, in copper; how much has he of each kind?

(16) The analysis of rye shews that it contains of water 13 per cent., flesh-forming substances 13·8 per cent., heat-givers 71·5 per cent., and mineral matters 1·7 per cent. Find the proportions of each in a cwt. of rye.

(17) *A* has  $\frac{1}{2}$  of a certain sum, *B*  $\frac{1}{3}$  as much as *A*, *C*  $\frac{1}{3}$  as much as *B*, and *D* who has the remainder has £6. 13. 4 more than *B*. How much has each?

(18) Divide 3717 into parts having the ratio of 17, 19 and 23.

(19) Divide 38 into two parts so that the quotient of the lesser divided by the greater may be  $\frac{5}{19}$ .

(20) Divide £700 among three persons so that the first may have half as much as the second, and the third twice as much as the first and second together.

(21) A debtor owes to *A* £21. 10. 0; to *B* £302. 11. 0; to *C* £119. 10. 6; and to *D* £175. 8. 6. His effects are worth £51. 11. 8. What can he pay to each?

(22) *A* and *B* contribute a certain amount of capital, and gain £45, of which *A* receives £3. 10. 0 more than *B*. What is the ratio of their respective amounts of capital?

(23) *A* contributes £300 to the capital of a partnership, *B* £750 and *C* £850. They gain £399; what amount is due to each?

(24) A joint capital produces £250 gain, of which *A* receives  $\frac{1}{3}$ ; *B*  $\frac{1}{4}$ ; and *C*, who contributed £495, the remainder. Find *A*'s and *B*'s shares of the capital.

(25) Divide £100 between two persons so that one may have five times as much as half of the other's share.

(26) A ship valued at £28000 is lost and is only insured to  $\frac{3}{4}$  its value. What amount of loss would fall on each of the owners if *A* owns  $\frac{1}{2}$ , *B*  $\frac{1}{3}$  and *C* and *D* the remainder equally?

(27) The rates paid to the Treasurer of a Union amount to £23261. 4. 0 $\frac{1}{2}$ , and are paid by seven parishes in the proportion of 15, 9, 7, 8, 3, 11 and 5 parts respectively; what was the contribution of each parish?

(28) The capital of a company consists of £58000 in shares of £100 each. *A* holds 90 shares; *B* 162; *C* 135; and *D* the remainder. The whole gain is £3480; find the gain of each.

(29) A piece of land measuring 30 ac. is let to three tenants; the first has a certain extent and pays £40, the second has 5 acres for a proportionate rent, the third pays £60 for as much land as the first and second have together. Find the rent per acre.

(30) Of the crew of a merchant-ship  $\frac{1}{3}$  are English,  $\frac{1}{4}$  Irish,  $\frac{2}{5}$  German and the remaining 57 Scotch. Find the number of each nationality.

(31) One thirteenth part of the cargo of a ship consists of iron,  $\frac{1}{13}$  of the remainder of grain,  $\frac{1}{13}$  of both these quantities of provisions, and the remainder, which weighs 1847 tons, of coals. Find the weight of iron, grain, and provisions.

(32) The gross amount earned by a railway company was £8470400 in 4 years. A dividend at the rate of 10 per cent. per annum is paid on the company's share capital of £12000000. Of the remainder, 30 per cent. is paid in wages, &c., 18 per cent. in maintenance of the permanent way, 25 per cent. for rolling stock, 17 per cent. for materials, and 10 per cent. in passenger-duty, rates, taxes, &c. Find the amount of each of these items yearly.

(33) *A*, *B* and *C* enter into partnership. *A* invests £400 for 3 months, *B* £700 for 7 months, and *C* £900 for 9 months. Find each one's share of the gain, £710.

## INVOLUTION.

Find the value of :—

- |                                     |   |
|-------------------------------------|---|
| (1) $31^3$                          | (19) $39^2 \times 48^3$   |
| (2) $925^3$                         | (20) $756^3 \times 756^3$   |
| (3) $456^4$                         | (21) $(806^2 + 31^2) \times 59$   |
| (4) $31 \cdot 5^3$                  | (22) $(571^3 - 621^2) \times 11^3$  |
| (5) $1 \cdot 13^3$                  | (23) $(397^2 + 397^3) \div 39700$   |
| (6) $9 \cdot 289^3$                 | (24) $(15^2 - 1 \cdot 31^2) \div 15$  |
| (7) $51^6$                          | (25) $(3 \cdot 04^3 + 30 \cdot 4^2) \div 304^2$                             |
| (8) $17^9$                          | (26) $31(31^2 + 72^3 + 23^4)$   |
| (9) $529^4$                         | (27) $1 \cdot 03(4 \cdot 07 + 3 \cdot 16)^2$                                |
| (10) $10 \cdot 05^3$                | (28) $3000(1 \cdot 1 \times \cdot 031)^3$                                   |
| (11) $23^2 + 15^2 + 3^3$            | (29) $7 \cdot 06^2 \times 3 \cdot 14^3$                                     |
| (12) $17^2 + 36^3 + 19^4$           | (30) $(7 \cdot 03^2 \times \cdot 19)^2 \div (3 \cdot 14 \times \cdot 02)^3$ |
| (13) $516^3 - 496^2$                | (31) $(\frac{17}{34})^2$  |
| (14) $1 \cdot 031^3 - 1 \cdot 03^3$ | (32) $(\frac{18}{19})^3$  |
| (15) $372 \cdot 5^2 - 36^3$         | (33) $(\frac{5}{8})^5$  |
| (16) $506^2 + 506^3 - 307^3$        | (34) $(\frac{17}{34})^5$  |
| (17) $38^2 + 17^3 - 18^3$           | (35) $(\frac{118}{558})^3$  |
| (18) $502^3 + 18^3 - 1376^2$        | (36) $(2\frac{1}{7})^4$   |

## EVOLUTION.

Find the value of the following, correct to 5 places of decimals :

- |   |  |
|---|--|
| <p>(1) <math>\sqrt{379456}</math></p> <p>(2) <math>\sqrt{276676}</math></p> <p>(3) <math>\sqrt{531441}</math></p> <p>(4) <math>\sqrt{665856}</math></p> <p>(5) <math>\sqrt{226576}</math></p> <p>(6) <math>\sqrt{351649}</math></p> <p>(7) <math>\sqrt{763876}</math></p> <p>(8) <math>\sqrt{268324}</math></p> <p>(9) <math>\sqrt{94249}</math></p> <p>(10) <math>\sqrt{1002001}</math></p> <p>(11) <math>\sqrt{1\cdot0609}</math></p> <p>(12) <math>\sqrt{158\cdot76}</math></p> <p>(13) <math>\sqrt{36\cdot3609}</math></p> <p>(14) <math>\sqrt{3113\cdot64}</math></p> <p>(15) <math>\sqrt{796}</math></p> <p>(16) <math>\sqrt{801}</math></p> <p>(17) <math>\sqrt{638}</math></p> <p>(18) <math>\sqrt{4\cdot03}</math></p> <p>(19) <math>\sqrt{3\cdot69}</math></p> <p>(20) <math>\sqrt{81\cdot4}</math></p> | <p>(21) <math>\sqrt{328} + \sqrt{7} + \sqrt{5}</math></p> <p>(22) <math>\sqrt{44} + \sqrt{91} - \sqrt{38}</math></p> <p>(23) <math>\sqrt{713} + \sqrt{962} + \sqrt{512}</math></p> <p>(24) <math>\sqrt{361} + \sqrt{64009}</math></p> <p>(25) <math>\sqrt{1142\cdot44} + \sqrt{11\cdot6281}</math></p> <p>(26) <math>5\sqrt{3} + 3\sqrt{5}</math></p> <p>(27) <math>11\sqrt{31} - 3\sqrt{29}</math></p> <p>(28) <math>8\sqrt{71} \times 3\sqrt{05}</math></p> <p>(29) <math>5\sqrt{02} \times 4\sqrt{3\cdot8}</math></p> <p>(30) <math>3\sqrt{2} + \sqrt{7} - \sqrt{3}</math></p> <p>(31) <math>\sqrt{97} \div \sqrt{90}</math></p> <p>(32) <math>\sqrt[3]{1728}</math></p> <p>(33) <math>\sqrt[3]{29791}</math></p> <p>(34) <math>\sqrt[3]{912673}</math></p> <p>(35) <math>\sqrt[3]{54872}</math></p> <p>(36) <math>\sqrt[3]{103823}</math></p> <p>(37) <math>\sqrt[3]{157464}</math></p> <p>(38) <math>\sqrt[3]{4741632}</math></p> <p>(39) <math>\sqrt[3]{207474688}</math></p> <p>(40) <math>\sqrt[3]{392223168}</math></p> |
|---|--|



- |  |  |
|--|--|
| (41) $\sqrt[3]{73}$                          | (56) $\sqrt[3]{\cdot 000128024064}$          |
| (42) $\sqrt[3]{962}$                         | (57) $\sqrt[3]{\frac{25}{36}}$               |
| (43) $\sqrt[3]{108}$                         | (58) $\sqrt[3]{\frac{81}{225}}$              |
| (44) $\sqrt[3]{312}$                         | (59) $\sqrt[3]{\frac{121}{256}}$             |
| (45) $\sqrt[3]{946}$                         | (60) $\sqrt[3]{\frac{1681}{2801}}$           |
| (46) $\sqrt[3]{813}$                         | (61) $\sqrt[3]{\frac{329}{7921}}$            |
| (47) $\sqrt[3]{594}$                         | (62) $\sqrt[3]{\frac{2209}{3481}}$           |
| (48) $\sqrt[3]{725}$                         | (63) $\sqrt[3]{\frac{4624}{529}}$            |
| (49) $\sqrt[3]{29}$                          | (64) $\sqrt[3]{\frac{14161}{519841}}$        |
| (50) $\sqrt[3]{38}$                          | (65) $\sqrt[3]{\frac{4761}{336400}}$         |
| (51) $\sqrt[3]{112}$                         | (66) $\sqrt[3]{\frac{512}{2197}}$            |
| (52) $\sqrt[3]{53} + \sqrt[3]{19}$           | (67) $\sqrt[3]{\frac{729}{157464}}$          |
| (53) $\sqrt[3]{41} + \sqrt[3]{85}$           | (68) $\sqrt[3]{\frac{300763}{1367631}}$      |
| (54) $\sqrt[3]{\cdot 000714} + \sqrt[3]{32}$ | (69) $\sqrt[3]{\frac{196122941}{197137368}}$ |
| (55) $\sqrt[3]{\cdot 000000634}$             | (70) $\sqrt[3]{\frac{28934443}{337153536}}$  |

## INVOLUTION AND EVOLUTION.

- (1) Find the cube root of the fourth power of 112.
- (2) What is the length of the side of a square containing 1151 sq. yds.?
- (3) What is the length of a square field containing an acre?
- (4) In any right-angled triangle the square of the hypotenuse is equal to the sum of the squares of the other two sides: find the area of a square field whose diagonal (*i.e.* a straight line joining two opposite corners) is 380 yards.
- (5) How many cubic feet of water are contained in a tank  $15\frac{1}{2}$  yards long, broad, and deep?
- (6) Find the content of a cubical vessel whose side is 41 ft.  $6\frac{1}{2}$  in.
- (7) How many cubical blocks, each edge measuring 4 in., may be cut from a piece of timber 4 feet long, broad and thick?
- (8) Applying Ex. 4. find the content of a cube, whose greatest diameter is 15 inches.
- (9) Find the value of  $\sqrt[3]{32} + \sqrt[3]{32} + \sqrt{32}$ .
- (10) From  $\sqrt[3]{133\frac{1}{8}}$  take  $\sqrt[3]{784}$ .
- (11) Find the value of  $\sqrt[3]{\frac{4013}{5832}} + \sqrt{\frac{224}{361}} - \sqrt[3]{\frac{3375}{54872}}$ .
- (12) To the square of  $1\frac{2}{3}$  add the cube of  $1\frac{2}{3}$ .
- (13) "The areas of circles are to each other as the squares of their diameters." Find the area of a circular pond whose diameter is  $3\frac{1}{3}$  times as great as another circular pond containing 819 square yards.
- (14) Find the square root of a number equal to the sum of the squares of 9 and 17.

(15) A ladder 28 ft. long, the foot of which is placed 7 ft. from a house, just reaches a window-sill; find the height of the window-sill from the ground.

(16) What is the length of the side of a cube, which contains 9 cub. yards 11 ft. 64 inches?

(17) A square field contains 35 acres : find the length of its diagonal.

(18) The diameter of a circle is 12 ft.; what is the length of the side of the inscribed square?

(19) The length of the side of the inscribed square of a circle is 31 ft.; find the area of the circumscribed square.

(20) How many square inches does the surface of a cube contain, the diagonal of whose side is 16 inches?

(21) Find the mean proportional between 9 and 16.

(22) Find the mean proportional between 5 and 9·8.

(23) Find the mean proportional between 50 and 79·38.

(24) Find the two mean proportionals between 3 and 24.

(25) Find the two mean proportionals between 5 and 40.

(26) Find the two mean proportionals between  $1\frac{1}{10}$  and  $70\frac{2}{3}$ .

(27) The weights of solid spheres of the same material are to each other as the cubes of their diameters. If a hollow spherical mould 4 inches in diameter will contain 1·25 lbs. Av. of water, find the weight of a round shot 12 inches in diameter, the specific gravity of cast iron being 7·250.



## EXAMINATION PAPERS.

### PAPER I.

1. WRITE in figures, one hundred and three, seven thousand six hundred and nine, forty thousand and twenty, eighteen hundred and six, and nine thousand four hundred and seven.

2. Give the following numbers in words: 7021, 307, 3009, 18087, 5010.

3. Add together 1509, 302, 27, 416 and 29.

4. Three and a half dozen books are bought for the first class, ninety-six for the second, one hundred and forty-four for the third, three score for the fourth, and seven dozen and three for the fifth. How many were bought altogether?

5. Twenty thousand five hundred and six persons visited the Crystal Palace on Monday, seventeen thousand and seventeen on Tuesday, three thousand two hundred and six on Wednesday, five thousand seven hundred and eight on Thursday, eleven thousand six hundred and ten on Friday, and thirty-seven thousand five hundred and eighty on Saturday. How many visited the palace during the week?

6. Add together 3170, 90061, 3117, 8694, 92184 and 4729; and give the answer in words.

7. Express in words the following numbers: 70070, 707, 5706, 9011610, 3210, 10176, and 40400.

8. Eleven thousand three hundred bales of cotton were landed on Monday, thirty-three thousand six hundred and eight on Tuesday, one hundred and four thousand three hundred and sixty on Friday, and three thousand seven hundred and nine on Saturday. How many were landed during the week?

9. Add together 3190, 187965, 931472, 8296 and 3147; and express the result in words.

10. Add together thirty millions five hundred and eight thousand six hundred, twenty-three thousand twenty-three hundred and twenty-three, ninety-one thousand and nineteen, eighteen thousand eighteen hundred and eight, and fifty-nine millions eleven thousand and one.

## PAPER II.

1. Out of a box containing two hundred oranges, which were selling at sixteen for a shilling, a fruiterer sold three shillings worth, five sixpenny-worths, and 14 threepenny-worths. How many were left?

2. Seventeen thousand three hundred bales of cotton were brought to Manchester on Monday, and the sales were two thousand three hundred and twenty bales; eight thousand were brought on Wednesday and ten thousand six hundred and twenty-six were sold; while on Saturday four hundred and seven were brought and three thousand six hundred and forty-six were sold. How many remained in stock?

3. From one million one thousand and one, take thirty-seven thousand thirty-seven hundred and thirty-seven.

4. Multiply the sum of  $379 + 3894 + 92016 + 109 + 3991$  by 27 times 28.

5. To 9 times 1106 add 7 times 596, and from the sum take 7935.

6. Take thirty-seven millions thirty-five thousand six hundred and eighteen from 110011007; and give the result in words.

7. Take eleven thousand and nineteen from thirty-three times eleven hundred and seventy-six.

8. A person bought 119 dozen, 70 score, and sixteen quarts of plums, and sold 796 quarts; how many remained?

9. Add together 30210, 4719, 8726, 3824, and 4967; take 40791 from the sum and multiply the result by 25.

10. To the seventh part of 83412 add 5 times 965.

## PAPER III.

1. From the sum of eleven thousand seven hundred and seventy-five, and eleven thousand one hundred and eighty-nine, take seven times their difference.

2. How many times is four hundred and four thousand and sixty contained in eleven millions ten thousand and forty?

3. After subtracting 357 thirty-five times from a certain number there remains 309; what is the number?

4. Multiply the half of eleven hundred and sixty-two by twice the third part of 402.
5. Take three thousand and ninety-two from four thousand one hundred and ninety-one and multiply the remainder by 608.
6. A book consists of 72 sheets, each containing 8 pages; how many pages are there in 3 dozen copies?
7. A year consists of 365 days; how many days are there in 19 years 213 days?
8. Find the sum of the third, fourth, fifth, sixth, and seventh parts of 32760.
9. Divide 10190715 by 999.
10. Multiply 371259 by 3710059.

## PAPER IV.

1. Reduce 3180 threepences to fourpences.
2. What number is that which multiplied by 7 gives 217?
3. How many times is 19 contained in 71318?
4. What is the difference between seven times 814 and five times 998?
5. How many farthings are there in £11. 15. 3?
6. What amount of money will purchase 11 tea sets at 15s. 9½d. each?
7. How many dozens are there in 126 scores?
8. Multiply the half of 3156 by the half of 998.
9. A person sells 5½ gross boxes of matches, gaining 2½d. per dozen. How much is gained altogether?
10. Reduce 90611 sixpences to pounds, &c.

## PAPER V.

1. Divide 3011011 by 346.
2. From £5. 1. 6 take £3. 12. 9¼.
3. How many times is 10½d. contained in 3 guineas?
4. Find the ninth part of £70. 17. 10½.
5. Find the cost of 83 tons of Nitrate of Soda at £12. 2. 4 per ton.
6. Multiply £42. 7. 7¼ by 162.
7. Reduce 7000 farthings to pounds, &c.
8. What amount of money divided equally amongst 17 persons will give £5. 7. 9 to each?

9. Divide £32. 11. 4½ by the twenty-seventh part of 999.
10. How many yards of linen at 2s. 10d. per yard must be given in exchange for 1628 yds. of calico at 8½d?

## PAPER VI.

1. A tradesman gains £931 in a year; what is that per week?
2. Multiply £39. 16. 0½ by 39.
3. Divide £702. 11. 6¼ by 37.
4. What is the cost of 7 dozen at 3s. 6½d. each?
5. Divide 70213169 by 83.
6. A person in receipt of £200 a-year pays 8s. 6d. weekly for rent, and £7. 10. 0 for rates and taxes yearly; how much may he spend weekly so as to save thirty guineas in the year?
7. How many lbs. of butter at 1s. 9d. may be bought for £3. 10. 0?
8. What would 7¼ dozen books cost at 2s. 6d. per copy?
9. Reduce 108 fourpences to threepences.
10. Find the cost of 17½ yards of calico at 8½d. per yard.

## PAPER VII.

1. Find the sixty-third part of £72. 11. 10 and 117 times £1. 19. 9½d.
2. Find the cost of 43 lbs. of gold at £3. 17. 10½ per ounce.
3. Find the amount of 73 days' wages at the rate of 150 guineas per annum.
4. How much cloth at 11s. 3d. per yard may be bought for £446?
5. How many days are there from March 16 to Dec. 13?
6. How often may 5s. 6½d. be taken away from £5. 10s. 10d.?
7. How many times does a clock beating seconds tick in a week?
8. What is the cost of 19½ articles at £3. 2s. 6d. each?
9. If a person spend 10s. 11½d. daily, what does he save from an income of £250 a year?
10. If £52. 1s. 9d. pays the weekly wages of 36 women, what does each one earn per month?

## PAPER VIII.

1. If a person spends on the average 8s. 1¼d. per day, what does he spend in a year?
2. Reduce 7 millions of feet to miles.



3. A person receiving £220 a year spends 10s.  $1\frac{1}{2}d.$  per day during the months of January, March, and April, 11s.  $7\frac{3}{4}d.$  per day during June, July, and December, and 5s.  $8\frac{1}{2}d.$  per day during the rest of the year. What does he save yearly?

4. A gardener has two trees, each bearing 125 score 7 dozen and sixteen apples, which he sells at 5 for 2d. What does he realise?

5. Find the cost of 17 bushels of oats at  $10\frac{1}{2}d.$  per peck.

6. Divide 308 guineas equally amongst 42 persons.

7. How many sixpences are there in £7. 6s. 6d.?

8. Find the cost of  $11\frac{1}{2}$  lbs. of butter at 1s. 5d. per lb.

9. Find the difference of £31. 13s.  $7\frac{1}{2}d.$  and 70310 farthings.

10. Divide 8 times 7s.  $9\frac{1}{2}d.$  by 17.

## PAPER IX.

1. A ham weighing 17 lbs. cost 14s. 2d., what is that per lb.?

2. A farmer bought 11 oxen at £27 each, and sold 48 sheep at 47s. each. How much more money would he pay than he received?

3. Divide the third part of 3 guineas and a half amongst seven persons equally.

4. Multiply £3. 13s.  $7\frac{3}{4}d.$  by 474.

5. Divide £201. 11s.  $10\frac{1}{4}d.$  by 37.

6. The wages of 7 men for a day is £1. 11.  $9\frac{1}{2}$ ; what is that for each?

7. How many articles at 4s. 3d. for 17 may be purchased for £5?

8. What is the cost of  $13\frac{1}{2}$  gross at 7s. 6d. per dozen?

9. By how many is six dozen dozen greater than half-a-dozen dozen?

10. What is the difference of seven times the half of £1. 2. 9 and four times the seventh part of 5 guineas?

## PAPER X.

1. How many at 5s.  $8\frac{1}{2}d.$  each may be bought for £31. 7. 11?

2. What is the cost of 115 yds. of linen at  $11\frac{1}{4}d.$  per yard?

3. Find the cost of  $5\frac{1}{2}$  tons of coal at 15s.  $9\frac{1}{2}d.$  per ton.

4. A load of hay containing 40 trusses is sold for £4. 10. 0; what is the price per truss?

5. When hay is at 1s. 2d. per stone, what will a ton cost?
6. The rent of a house is £14. 6. 0 per year, what is that per week?
7. Take 3 times 11s. 6½d. from the half of five guineas.
8. Reduce 25 guineas to half-crowns.
9. Reduce the sum of £4. 11. 10, £5. 1. 6, £8. 3. 9, and £7. 2. 6 to pence.
10. The windows of a row of houses, 27 in number, each house having 7 windows containing 16 panes of glass each, are glazed at a cost of 7d. per pane; what is the entire cost of glazing?

## PAPER XI.

1. Divide 314276921 by 17, and by 23.
2. How many days are there from March 2 to Aug. 23 of the same year?
3. Multiply £3. 12. 9¼ by 37 and 43.
4. Divide £345. 13. 2¾ by 95.
5. A boy earns 13s. 7¾d. weekly, in what time will he earn £11. 11. 11¾?
6. Out of 17305 votes the successful candidate at an election received 1707 more than his opponent; what were the numbers of each?
7. On dividing 312476921 by a certain number the quotient is 6648445 with 6 as a remainder; what is the divisor?
8. Divide £15. 14. 8¼ by 7½.
9. If 5 men, 9 women, and 8 boys jointly earn £780 in a year, and a man earns as much as three women or four boys, what does each earn weekly?
10. Reduce 312061 yards to miles.

## PAPER XII.

1. How many threepences are there in the sum of £5, 5 half-sovereigns, 5 crowns, 5 half-crowns, 5 shillings, and 5 sixpences?
2. What is the cost of 11¾ lbs. of beef at 10d. per lb.?
3. How many dozen pairs of gloves may be bought for £21 at 3s. 6d. per pair?
4. A person spends 35s. 7d. weekly, thus saving £38. 10. 6 out of his income yearly; what is his income?

5. At 3s. 3½d. per yard I buy 19½ yards of serge and tender a five pound note in payment; what change should I receive?
6. What cash with 13 dozens of wine at 45s. per doz. must be given in exchange for 11 pieces of cloth, each 12½ yards, at 7s. 6d. per yard?
7. What must be given for 14 tons of hay at £4. 19. 0 per ton?
8. What weight of potatoes at £3. 12. 9¼ per ton may be bought for £134. 12. 6¼?
9. Multiply £3. 17. 10¼ by 93 and by 218.
10. What does the sale of 55½ dozen of sherry realise at 30s. per dozen?

## PAPER XIII.

1. What number contains 3756 exactly 13½ times?
2. If a pace be 20½ inches, how far does a person go in making 11300 paces?
3. What number divided by 91 will give 37 as quotient and a remainder of 38?
4. By how much is £7000 greater than seven hundred and seven thousand and ten pence?
5. From sixteen thousand and ten pounds take sixteen thousand sixteen hundred and sixteen pence.
6. How many shillings are there in 81904 half-farthings?
7. What number multiplied by 36 will give 58008096?
8. The number of eggs annually consumed in Paris during the five years 1847—51 are thus given in the official returns: 129940724; 106747222; 113587732; 124597150 and 129732297. Find the average yearly consumption.
9. Find the cost of 75½ dozen eggs at two for three-halfpence.
10. A boy earns 8s. 9d. a week; what is that in a year?

## PAPER XIV.

1. From eleven hundred cwt. take eleven hundred lbs.
  2. What is the weight of 17 parcels, each 19½ stones?
  3. From 11 acres subtract 1 r. 1 p. 1 yd., and multiply the remainder by
- 11.

4. How many gallons are contained in 51 qrs. 3 bus. 3 pks.?
5. Reduce 93216 pints to bushels, and the same number of farthings to £.
6. On dividing a certain sum of money among 89 persons, each receives £5. 12.  $8\frac{1}{2}$ ; what would each have received had there been 13 persons less?
7. Reduce 370215 farthings to £, and £57. 12. 9 to threepences.
8. Divide £36. 13.  $0\frac{1}{4}$  by  $8\frac{3}{4}$ .
9. How far will a person walk in  $3\frac{1}{2}$  hours if he takes 520 steps of  $2\frac{1}{2}$  ft. each every 4 minutes?
10. Reduce 3410 dollars, each worth 4s. 6d., to English money, and find the number of cents (100 to the dollar) in £3. 16. 6.

## PAPER XV.

1. Divide £80. 11. 10 by 38.
2. Reduce £15. 19.  $10\frac{3}{4}$  to farthings.
3. Find the cost of 89 ounces of gold at £3. 17.  $10\frac{1}{2}$  per oz.
4. A certain parish has a rateable value of £9061; what will a rate of twopence in the £. produce?
5. What would be the amount of seven third-class railway fares from Tamworth to London at 9s.  $1\frac{1}{2}d.$ , and two first-class at 15s. 7d.?
6. How many posts, each 6 ft. apart, would be required in fencing a circular plot of ground half a mile round?
7. How many sovereigns are there in 70215 halfpence?
8. Multiply £3. 14.  $2\frac{1}{2}$  by 796.
9. Divide £5. 11.  $6\frac{1}{4}$  by  $3\frac{1}{2}$ .
10. If £2190. 3.  $0\frac{1}{2}$  maintains 146 persons, what is the average cost of each?

## PAPER XVI.

1. Divide five thousand pounds equally amongst 72 persons.
2. How many paces, each 1 ft. 9 in., would a person take in walking  $3\frac{1}{2}$  miles?
3. From the difference of 407 pounds and 407 half-guineas take the difference of 407 half-crowns and 407 farthings.

4. Find the difference between eleven hundred and six times £31 and 1106 times 31 pence.
5. What is the cost of  $3\frac{1}{2}$  gross of lead-pencils at  $3\frac{1}{2}d.$  per dozen?
6. Multiply 19s.  $3\frac{1}{2}d.$  by 37.
7. Find the weight of 13031 packets of corn flour, each weighing 8 ounces.
8. Divide seventy thousand five hundred and eighty cwt. by 250.
9. What is the cost of 27 panes of glass at  $11\frac{3}{4}d.$  each?
10. *A* has a certain sum; if he had 1s.  $7\frac{1}{2}d.$  more he would have seven times as much. What has he? Give reasons for the method of solution.

## PAPER XVII.

1. From £130. 10. 0 take 1300 pence.
2. *A* has £10. 11. 0 and pays *B* 535 pence; *B* has 2700 pence at first and pays *A* £2. 11. 9. How much has *A* now more than *B*?
3. A timber merchant buys 11 trees containing on the average 473 feet of timber each; if he sells the whole at  $3\frac{1}{2}d.$  a foot what does he realise?
4. How many revolutions does a cart wheel 12 ft. round make in going a mile and a half?
5. How many gallons of water are there in a cistern containing  $11\frac{3}{4}$  cwt., supposing a quart of water to weigh 2 lbs.?
6. Multiply £11. 4.  $9\frac{1}{2}$  by 389.
7. What sum of money divided equally amongst 23 men will give £2. 1. 4 to each?
8. In the construction of a bridge 277125 bricks are used. Find their cost at £3. 14. 6 per thousand.
9. After paying the amount of  $5\frac{1}{2}$  fares, each 13s.  $8\frac{1}{2}d.$ , what change do I receive out of a £5 note?
10. To five times the third part of £4. 11.  $9\frac{3}{4}$  add six times the fifth part of £9. 11. 3.

## PAPER XVIII.

1. How many boys standing in a straight line and placed 5 feet apart would reach a quarter of a mile?
2. Divide 7916037 by 79, and prove the correctness of the result.

3. How many times is 3s. 6d. contained in  $7\frac{1}{2}$  guineas?
4. A merchant bought 51 cwt. 1 qr. 14 lbs. of butter at 135s. per cwt., and retailed it at 1s. 5d. per lb.; what was his gain on the whole?
5. What amount of rate should a row of 13 houses pay, each assessed at £15, if the rate be 2s. 4d. in the £?
6. The North Eastern Railway Company carried in a certain period 10,500,000 passengers, of whom  $\frac{1}{5}$  were first-class at an average fare of 11s. 8d. each,  $\frac{1}{5}$  second-class at 5s. 9d. each, and the remainder third-class at a fare of 7s. 10½d. each. What was the total amount received?
7. Reduce 504 guineas to florins.
8. A mile contains 1760 yds. and a knot 2000 yards. What is the difference between 16 miles and 16 knots?
9. A ham weighing 19 lbs. cost 18s. 2½d. What was that per lb.?
10. Reduce 70711234 grs. Troy to lbs.

## PAPER XIX.

1. What is the cost of  $41\frac{1}{2}$  dozen primers at 3½d. per copy?
2. From 3 times the fourth part of £2. 10. 0 take the half of the fifth part of ten guineas.
3. What number multiplied by 16 will give 12 score?
4. Reduce 30313 lbs. to tons.
5. How many boys' suits at 8s. 11d. each can be obtained for £26. 15. 0?
6. From thirteen hundred pounds take thirteen hundred and thirty half-crowns.
7. Find the cost of  $3\frac{1}{2}$  gross of copy-books at 1s. 7½d. per dozen.
8. Find the total cost of  $3\frac{1}{2}$  first-class fares at 8s. 6d., 9 second-class at 6s. 7½d., and  $26\frac{1}{2}$  third-class at 4s. 3d.
9. Find the cost of carriage of 1 ton  $11\frac{1}{4}$  cwt. for 107 miles at 6¼d. per mile.
10. Find the value of  $323\frac{1}{4}$  cwts. of butter at £4. 11. 8 per cwt.

## PAPER XX.

1. Divide £9013. 10. 3 by 122.
2. What in English money would be the weekly wages of a workman earning 38 dollars a month, reckoning a dollar to be 4s. 2d.?

3. What remains after subtracting 297 as often as possible from 30051638?
4. Find the rent of 7 acres of land at £3. 17.  $10\frac{3}{4}$  per acre.
5. Divide a million by 427, and prove the result.
6. What is the cost of 746 tons of wrought iron at £9. 19.  $11\frac{3}{4}$  per ton?
7. A farm of 87 acres is rented for £369. 11.  $4\frac{1}{2}$ ; what is that per acre, and find the rent of  $5\frac{1}{2}$  acres at the same rate?
8. Reduce 3 lbs. 5 oz. 11 dwts. 13 grs. to grains.
9. How many times is 3 ft.  $2\frac{1}{2}$  in. contained in 3 m.  $2\frac{1}{2}$  poles?
10. Which is the greater and by how much, 3 times 4 cwt. 3 qrs. 7 lbs. or 5 times the fourth part of  $1\frac{1}{4}$  tons?

## PAPER XXI.

1. How many hurdles, each 7 ft. 6 in. long, would be required to fence a piece of ground a furlong square?
2. Find the weight of sugar in 22 casks, if each cask weighs 5 cwt. 3 qrs. 11 lbs. gross and  $\frac{1}{16}$  of this be deducted as tare.
3. What is the yearly out-put of coal at a colliery which sends 1 ton 12 cwt. to the surface every 5 minutes night and day, working from 6 A.M. on Monday to 2 P.M. on Saturday each week?
4. Reduce 3045813 ounces to tons, and the same number of inches to miles.
5. Reduce 14 ac. 1 r. 25 p.  $11\frac{3}{4}$  yds. 7 ft. 111 sq. inches to sq. inches, and 2 yrs. 316 dys. 1 hr. 59 m. 27 sec. to seconds.
6. If a horse consumes  $1\frac{1}{4}$  bus. of oats weekly, what quantity would be required by 71 horses for  $2\frac{1}{2}$  years?
7. Divide the sixth part of the half of 2 tons 5 cwt. by 3 times the fourth part of  $\frac{1}{7}$  of 21.
8. From 1 ton 3 qrs. 12 lbs. take 13 cwt. 3 qrs. 27 lbs. 9 oz.
9. Divide 312 cub. yds. 3 ft. 123 in. by 51, and prove the result.
10. What is the cost of 3 cwt. 3 qrs. 12 lbs. of flour at 2s. 4d. per stone?

## PAPER XXII.

1. The height of Chimborazo, one of the Andes, is 21440 feet. Express it in miles, &c.
2. Multiply £2. 1. 7 by 17, and subtract half the result from 21 guineas.

3. Write down the square of 59178 and the cube of 3479.
4. Reduce 4 millions of inches to miles, &c.
5. A certain number divided by 87 gives 909239 and 24 remainder. Find it.
6. How many days are there in  $1\frac{3}{4}$  centuries?
7. Reduce 101 m. 3 fur. 1 yd. to half yards.
8. What length of cloth is contained in 11 bales, each consisting of 5 parcels, each parcel being 10 pieces, and each piece 33 yds. 1 qr.?
9. A gardener sends to market 30 baskets of potatoes, each basket containing  $2\frac{1}{2}$  bushels. If they are sold at 1*d.* per lb. what would they realise, supposing a peck to contain 14 lbs.?
10. A rail maker buys 190 tons of old iron rails at £4. 14. 0 per ton, and sells 376 tons new rails at £11. 10. 0 per ton. What is the difference in the amounts?

## PAPER XXIII.

1. What is the cost of a gross of packets of lead-pencils, each packet containing a dozen, at  $5\frac{1}{2}$ *d.* per doz.?
2. What amount of wages is due to a person for 73 days service at 5*s.*  $7\frac{1}{2}$ *d.* per day?
3. Within a certain period 209510 bushels of corn were delivered by steamer at the port of London; the average rate of wharfage was 1*s.* 2*d.* per quarter. What did this amount to?
4. Multiply 3 tons 17 cwt. 2 qrs. 11 lbs. 9 oz. by 2127.
5. How many times is 77 cwt. 2 qrs. 11 lbs. 9 oz. contained in 15758 tons 3 qrs. 12 lbs. 11 oz.?
6. What is the cost of  $11\frac{1}{2}$  yds. of flannel at 1*s.* 6*d.* per yard?
7. A tap discharges  $2\frac{1}{2}$  gallons per minute. How long would it take to empty a cistern containing 125 gallons?
8. How many times does a carriage wheel 5 ft. round revolve in a journey of  $4\frac{1}{2}$  miles?
9. A person exchanges 11 yards of cloth at 11*s.* 8*d.* per yard for 70 yards of calico at  $6\frac{1}{2}$ *d.* per yard; what money should he also receive?
10. Find the difference between  $7\frac{1}{2}$  times 11*s.*  $6\frac{1}{2}$ *d.* and 3 times the fourth part of 5 half-guineas.



## PAPER XXIV.

1. A boy was born on the 9th March, 1862 ; how many days old was he on the 23rd October, 1878, taking account of leap years?

2. The 29th July is on a Monday ; on what day of the week does Christmas day fall in that year?

3. How many halfpence are contained in the change received out of a sovereign after paying for 5 yards of linen at 2s. 11½d. per yard?

4. If I draw £400 from the bank, pay £306. 12. 10½, and receive £73. 19. 6½, what have I left?

5. What is the cost of 2¼ score sheep at £3. 11. 10 per head?

6. After cutting away one-seventh of the length of a beam I find it is still 10yds. 2 ft. long. What was its former length?

7. How many days are there from the 29th Feb. to the 16th Nov. of the same year?

8. Find the whole cost of 12½ gross of pens at 6¾d. per dozen, 5¼ gross copy-books at 1½d. each, 13 dozen and 7 slates at 5d. each, and 8 boxes of pencils at 7½d. per box.

9. Multiply £3. 16. 8¾ by seven times 119.

10. A tradesman pays 42 guineas a year rent ; how much is that per week?

## PAPER XXV.

1. Find the cost of equipping 32000 troops, each with a blanket at 8s. 9d., uniform suit at 45s., 3 months provisions costing £19. 16. 8, a rifle at £2. 17. 0, and a tent costing £4. 5. 0 for every 4 men.

2. A gas meter shews a total consumption of 50854 cub. ft. ; last quarter it indicated 43729. Find the cost of consumption for the quarter at 4s. 6d. per thousand.

3. How many days are there from Jan. 18th, 1854, to July 6, 1878, both inclusive, taking account of leap years?

4. How many drain pipes, each 1 ft. 4½ in. long, would be required for laying three drains, 199 yards, 302½ yards, and 472 feet respectively?

5. Reduce 70711234 drams to tons.

6. In 5 ac. 3 r. 12 p. how many yards? Prove the correctness of the result.

7. How many articles at 1s. 6 $\frac{1}{4}$ d. each may be bought for £18. 5. 0?
8. At a collection there was found in the boxes 11 sovereigns, 19 half-sovereigns, 5 crown pieces, 107 half-crowns, 130 florins, 268 shillings, 119 sixpences, 58 fourpenny pieces, 111 threepenny do., 19 pence, 5 halfpence and a farthing. What was the whole sum collected?
9. How many hours are there in 3 $\frac{1}{2}$  weeks?
10. Find the cost of 13008 articles at £2. 1. 11 $\frac{1}{4}$  each.

## PAPER XXVI.

1. Reduce 7000000 lbs. to tons.
2. Divide £12. 0. 7 $\frac{3}{4}$  by 57, and prove the result.
3. From 19 cwt. 3 qrs. take 17 cwt. 1 qr. 19 lbs., and find the value of the remainder at 7d. per lb.
4. How many cub. yds. are there in 70711234 cubic inches?
5. Find the cost of 960 tons of old iron at £3. 0. 11 $\frac{1}{4}$  per ton.
6. Reduce 703 guineas to account money.
7. Multiply the half of £1. 11. 10 $\frac{1}{2}$  by 3 times the half of 68.
8. How many articles at 6s. 8d. each may be bought for £25. 13. 4?
9. If 5 score and nine articles cost £54. 19. 1, what is that for one?
10. What was the cost of 16 $\frac{3}{4}$  tons of coal at 13s. 4d. per ton?

## PAPER XXVII.

1. Reduce 1100 inches to yards, and 1100 yards to poles.
2. How many days are there from July 1st to Sept. 15 of the same year, both days included?
3. How many articles at 7s. 6d. for 3 can be purchased for 2 $\frac{1}{2}$  guineas?
4. Reduce 11 millions of square inches to acres.
5. What is the Simple Interest on £200 for 4 $\frac{1}{2}$  years at 1 $\frac{1}{4}$  per cent.?
6. How many acres of land may be bought for £9680 at 1 $\frac{1}{2}$ d. per square yard?
7. Find the total cost of 11 lbs. tea at 3s. 4d., 9 do. at 4s. 6d., 25 lbs. sugar at 4 $\frac{1}{2}$ d., 2 stones do. at 3 $\frac{1}{2}$ d. per lb., 5 $\frac{1}{2}$  lbs. coffee at 1s. 10d., 11 lbs. butter at 1s. 5d., 18 lbs. biscuits at 8d., and 7 bars soap, each 3 $\frac{1}{2}$  lbs., at 4d. per lb.

8. Multiply £2. 11. 10 $\frac{1}{4}$  by 51, and the result by 6.
9. Reduce 39168 half-crowns to guineas.
10. A bar of tempered steel 1 inch square will bear a strain of 153741 lbs. Express this weight in tons.

## PAPER XXVIII.

1. Multiply 3 lbs. 5 oz. 11 dwts. 13 grs. by 370.
2. Reduce 5 million square inches to roods.
3. Find the value of 11 ac. 3 r. 11 p. at £2. 10. 0 per acre.
4. Find by the rule of Practice the value of 705 articles at £1. 19. 8 $\frac{3}{4}$  each.
5. If 15 cwt. cost 11s. 6d., what is that per ton?
6. Find the cost of 3 tons 7 cwt. 2 qrs. at 2 guineas for 1 ton 1 cwt.
7. If 7 men mow 3 ac., how many men would be required to mow 42 acres in the same time?
8. Find the cost of 11 cwt. 3 qrs. 12 lbs. of leaden piping at 7s. per yard, if each yard weighs 18 lbs.
9. How many yards of matting at 5 half-crowns for 100 yards may be bought for £15?
10. The 7.10 a.m. train from Tamworth passes Nuneaton, a distance of 13 miles, at 7.36. If it travels at a uniform rate, when will it reach London, a distance from Nuneaton of 96 $\frac{1}{2}$  miles?

## PAPER XXIX.

1. Reduce 70319 grains Troy to lbs. Troy and Avoirdupois.
2. In 36 lbs. 4 oz. Avoirdupois how many Troy grains?
3. Reduce 93 lbs. Avoirdupois to Troy weight.
4. A farmer bought four score and six sheep at £3. 9. 4 a head, and sold 11 bullocks at 23 guineas each; what was the difference in the sums paid and received?
5. A gas company charges 4s. 3d. per thousand cubic feet, and a fish-tail burner consumes 2 $\frac{1}{2}$  ft. per hour. What would be the charge for lighting a town with 200 lamps for a fortnight if each lamp be kept burning on the average 12 $\frac{1}{2}$  hours per day?

6. A person starts to pick up 20 stones placed in a straight line a yard apart, carrying each one separately to the end of the line. What distance does he travel?

7. What is the average price of wheat per. qr. when on Monday it is quoted at 69s. 11d., on Tuesday at 71s. 6d., on Thursday at 69s., and on Saturday at a further decline of 1s. 6d. per qr.? Explain the meaning of the term "average."

8. How many articles at 19s. 3½d. each may be bought for £38. 11. 8?

9. Find the cost of 13 cwt. 3 qrs. 12 lbs. 8 oz. at £9. 10. 0 per cwt.

10. What is the value of 11 yds. 2 ft. 6 in. at 3s. 9d. per yard?

#### PAPER XXX.

1. What is the cost of 7 chests of tea, each weighing 95 lbs., at 3s. 4d. per lb.?

2. The poor's rate on a certain property at 7d. in the £ produced £9. 11. 8. What was the rateable value?

3. What is the weight of 17 trucks of merchandise containing on the average 5 tons 11 cwt. 3 qrs. 12 lbs. each?

4. A crop of grass averages 2 tons 9 cwt. 3 qrs. per acre; what is that for 110 ac. 3 r. 30 p.?

5. Reduce 70711234 gallons to loads.

6. Find the value of 68 ac. 1 r. 24 p. at £25 per acre.

7. Bought oranges at the rate of two for three-halfpence and sold them at seven for sixpence; how much was gained on a box containing 3 gross?

8. A person buys the freehold of 107 acres 0 r. 13 p. at £80 per acre; what does he pay for it?

9. Multiply 3 tons 17 cwt. 2 qrs. 11 lbs. 9 oz. by 4963.

10. How many times may 17s. 11½d. be taken from 19 guineas?

#### PAPER XXXI.

1. If 25 francs = £1 sterling, reduce 3½ millions of francs to English money.

2. Reduce 70711234 inches to miles.

3. The cost of maintaining 70000 refugees averaged 2 piastres (each 2½d.) per head per day. What sum of money would be required to maintain the whole during the month of May?

4. Find the value of 84 ac. 0 r. 20 p. of land cropped with potatoes at £15. 10. 0 per acre.
5. How many times may 7s. 3d. be taken from £5. 8. 9?
6. What is the sum received per month (4 wks.) on the sale of the "Standard," averaging 202451 copies daily, at 7½d. per dozen copies?
7. How many days are there from Jan. 20th, 1878, to July 9, 1879?
8. Write down the square of 395167.
9. What weight of metal is contained in 11 bars, each weighing 5 cwt. 3 qrs. 11 lbs.?
10. Five barrels of tobacco, each weighing 3 cwt. 1 qr. 5 lbs. nett, were bought at the rate of 2s. 8d. per lb. What did the whole cost?

## PAPER XXXII.

1. Reduce 70711234 grs. to lbs. Apothecaries' weight.
2. How many yards of cloth at 1s. 5d. per yard must be given in exchange for 620 yards calico at 4¼d.?
3. A bankrupt owing £600 can pay 5s. 3d. in the £; what is the amount of his assets?
4. Reduce 11000000 square yards to square miles. Explain the method of reducing square yards to poles.
5. A horse and carriage cost 80 guineas, but the horse cost ¼ as much again as the carriage. What was the price of each?
6. How many bricks, each 9 in. long by 4½ in. wide, will pave a square courtyard one side of which is 60 feet?
7. Find the Simple Interest on £200 from Jan. 6th, 1870, to July 5, 1874, at 3 per cent. Explain by reference to this example the meanings of: *Simple Interest, Per Cent., Principal and Amount.*
8. Find the value of 31 ac. 3 r. 12 p. at £16 per acre.
9. A person pays £111. 5. 0 income tax at the rate of 4d. in the £; what was his income?
10. How many yards of calico at 6¾d. may be bought for £1. 7. 0?

## PAPER XXXIII.

1. Reduce 9603711 inches to miles, &c. Show how the tables of Square and Cubic Measures may be constructed from Long Measure.
2. A tradesman allows 5 per cent. discount for cash; if he takes 2s. 6d. off a bill of £3. 12. 6, what is this less than the right amount of discount?

3.  $A$  has now 8 times as much as  $B$ , if he had £4. 12. 0 more he would have 9 times as much. How much has  $B$ ?

4. If 13 men do a piece of work in 9 days, how long would 26 men require to do half the work? Define "*Ratio*" and "*Proportion*." What is meant by "*Inverse Ratio*"?

5. What is the cost of 13 tons at £6. 10 for 5 tons 10 cwt.?

6. How many yards of canvas  $\frac{3}{4}$  of a yard wide would be required for an awning 93 ft. long by  $3\frac{3}{4}$  yards wide?

7. Reduce 11 lacs of rupees (each 100000) to English money, reckoning the rupee at 1s.  $9\frac{1}{2}d$ .

8. How many pairs of gloves at £1. 1. 0 the half dozen may be bought for £7?

9. Find the cost of  $111\frac{3}{4}$  yards at 18s. 6d. for 37 yds. 0 ft. 9 in.

10. Find the sum of 17 sovereigns, 51 half-sovereigns, 19 crowns, 113 half-crowns, 211 florins, 1396 shillings, 417 sixpences, 117 threepences, 99 pence, and 92 farthings.

#### PAPER XXXIV.

1. A certain ore yields 38 per cent. of iron. What amount of iron would be produced from 715 tons of ore?

2. Find the Simple Interest of £716 for 5 years at 3 per cent.

3. What is the value of 37 ac. 3 r.  $11\frac{1}{2}$  p. at £20 per acre? Give the meaning of the term "*Aliquot Part*."

4. If 15 men mow 7 ac. in 3 days, how long will it take 3 men to do twice as much?

5. If 19 ac. 3 r. cost £101, what is that for 138 ac. 1 r.?

6. A person dies in Paris leaving half a million of francs. What sum does this represent in English money if the £ sterling be equal to 25 francs?

7. What is the weight of 11 ricks of hay, each averaging 11 tons 13 cwt. 2 qrs.?

8. Divide £1. 10. 0 between  $A$  and  $B$ , giving  $A$  thrice as much as the half of  $B$ 's share.

9. The amount of the Government Vote of Credit actually spent in 1878 was £3,500,000. What weight of gold does this represent if each sovereign weighs 123 grains and there are 7000 grs. to the lb. Avoirdupois?

10. What will £111. 14. 6 amount to in 3 years at  $2\frac{1}{2}$  per cent. per annum Simple Interest?

## PAPER XXXV.

1. Find the cost of  $11\frac{1}{4}$  yards of silk at 8s. 11d. per yard.
2. Make an invoice of  
 $3\frac{1}{2}$  lbs. tea at 3s. 8d.,  $2\frac{1}{2}$  lbs. Indian tea at 4s. 2d., 6 lbs. coffee at 1s. 8d.,  $2\frac{1}{2}$  stones of soap at  $4\frac{1}{4}$ d. per lb.,  $1\frac{1}{4}$  doz. lbs. candles at  $6\frac{1}{2}$ d. per lb.,  $3\frac{1}{4}$  stones sugar at 5d. per lb., and 18 lbs. of moist do. at 3s. 6d. per stone.
3. Reduce 1102169 square feet to acres.
4. How many beams of timber, each 16 ft. long, would be required to make 192 posts, each 7 ft.  $9\frac{1}{2}$  in. long?
5. Divide £947. 4. 11 among 17 men and 13 boys, giving each man twice as much as a boy.
6. How many times is the sum of a penny, a sixpence, a shilling and a florin contained in £5. 7. 6?
7. If *A* begins to work at 6 each morning and *B* at 7.30, both leaving at the same time in the evening, how much would *A* earn more than *B* in a year, reckoning their wages at  $9\frac{1}{2}$ d. per hour?
8. From the third part of 17 yds. 1 ft. take the fourth part of 17 yds. 2 ft. 6 in., and find the value of the remainder at 3s. per foot.
9. How many steps, each having a  $7\frac{1}{2}$  inch riser, would be required for a staircase reaching a perpendicular height of 18 ft.  $1\frac{1}{2}$  in.?
10. At what rate per lb. should I sell 5 cwts. of coffee for which I gave £44. 6. 8 so as to gain £2. 6. 8 on the whole?

## PAPER XXXVI.

1. If the fare from Birmingham to London is 9s.  $1\frac{1}{2}$ d. third-class and 17s. 8d. first-class, what would be the total fares paid by 7 first-class and 23 third-class passengers?
2. Reduce 70711234 square inches to acres.
3. What is the profit on the sale of seven gross, 3 score, and  $3\frac{1}{2}$  dozen newspapers selling at 1d. each and bought at  $8\frac{1}{2}$ d. per dozen?
4. How much tea at 3s. 4d. per lb. together with  $7\frac{1}{2}$  half-pounds of raisins at 7d. per lb. may be bought for 35s.  $6\frac{1}{4}$ d.?
5. What is the weight of five casks, three of which contain 2 cwt. 1 qr. 11 lbs. each, and the others 3 cwt. 3 qrs. 3 lbs. each?
6. Divide 1s. 6d. between two boys, giving one  $1\frac{1}{2}$ d. more than the other.

7. What is the total cost of 3 lbs. tea at 3s. 8d., 15 lbs. sugar at  $5\frac{1}{2}d.$ , 1 stone soap at  $3\frac{1}{2}d.$  per lb., and 9 lbs. butter at 1s.  $5\frac{1}{2}d.$ ?

8. How many cubic feet of timber would be required for the sleepers of a double line of railway 18 miles long if each sleeper be 9 ft. long, 10 in. broad, and 8 in. thick, and they are placed 3 ft. apart?

9. Find the cost of 19 ac. 1 r. 10 p. of clover at £17. 10. 0 per acre.

10. Multiply 3 tons 17 cwt. 2 qrs. 11 lbs. 9 oz. by 709.

## PAPER XXXVII.

1. From 11 tons 5 cwt. 3 qrs. 12 lbs. take the seventh part of 46 cwt. and find the value of the remainder at £2 per ton.

2. How many acres may be rented for £115. 4. 2 at the rate of £1. 9. 2 per acre?

3. Find the value of  $316\frac{2}{3}$  tons of pig iron at £4. 3.  $11\frac{1}{2}$  per ton.

4. How many cubic yards are there in 390051 cubic inches?

5. A has a certain amount, if he had £5. 10. 0 more he would have six times as much. How much has he?

6. Bought 13 cwt. of sugar at £1. 7. 9 per cwt., and retailed the whole at  $4\frac{1}{2}d.$  per lb. What was the total gain?

7. If 15 horses plough 19 ac. 3 r. 20 p. in a certain time, how many acres could 45 horses plough in half the time?

8. A train travels  $9\frac{1}{4}$  miles in ten minutes; how far will it go in 1 hr. 45 min.?

9. Reduce to tons the sum of 11 cwt., 53 qrs., 475 stones, 2195 lbs. and 115 ounces.

10. If a yard measure expands  $\frac{1}{17}$  of an inch at a certain temperature, what error would arise in measuring  $5\frac{1}{2}$  furlongs?

## PAPER XXXVIII.

1. If 8 cwt. 3 qrs. of tea cost £160, what is that per lb.?

2. How many at  $1\frac{1}{2}d.$  each may be bought for 7 half-crowns?

3. Reduce  $111\frac{1}{4}$  miles to yards, and  $11\frac{1}{4}$  acres to square yards.

4. Reduce 70711234 seconds to years.

5. How many sleepers, placed 3 ft. apart, would be required for a double line of rails  $3\frac{1}{2}$  miles long?



6. A train travels at the rate of 5 miles in 6 minutes ; how far will it go in an hour and a half?

7. Multiply the half of  $7\frac{1}{2}$  guineas by 7.

8. After paying income tax at the rate of 5*d.* in the £. a person had £616. 17. 6 remaining. What was his income?

9. Divide 3 times the half of 1108 by 5 times the fourth part of 7 times 16.

10. Find the whole cost of

15	pareels, each	17 lbs. sugar	at $4\frac{1}{2}$ <i>d.</i>
3	„ „	19 lbs. do.	at 5 <i>d.</i>
12	„ „	11 lbs. rice	at $3\frac{1}{2}$ <i>d.</i>
9	„ „	18 lbs. currants	at $5\frac{1}{2}$ <i>d.</i>
7	„ „	9 lbs. raisins	at 6 <i>d.</i>
		and $18\frac{1}{2}$ lbs. butter	at 1 <i>s.</i> 6 <i>d.</i>

#### PAPER XXXIX.

1. If 16 men can do a piece of work in 5 days, how many could do it in 40 days?

2. What is the difference of 3 times the half of  $5\frac{1}{2}$  guineas and 7 times the fourth part of 4500 farthings?

3. Find the cost of 11 lbs. at 2*s.* 4*d.* per cwt.

4. What is the cost of 3 yards of calico if a roll measuring 84 yards cost two guineas?

5. How many yards of cloth at 11*s.* 6*d.* may be purchased for £6. 18. 0?

6. Multiply £3. 19. 6 $\frac{1}{4}$  by 708, and work out the same result by Practice.

7. In a town containing 11500 inhabitants there are on the average 22 deaths and 73 births per year in each thousand. What will be the increase in 20 years?

8. Find the value of 3 ricks of hay each 11 tons 13 cwt., at 4 guineas per ton.

9. A field of 7 ac. 2 r. is rented at £37. 10. 0 a year. What is that for 19 ac. 3 r.?

10. A cask of ale containing 36 gallons costs £1. 18. 0 and is retailed at 6*d.* per quart. What is the whole gain?

## PAPER XL.

1. If 11 articles cost  $17\frac{3}{4}$  guineas, how much is that for one?
2. A person earning 180 guineas a year spends on the average 6s. 9d. a day and saves 40 guineas in the year. Of the rest he pays  $\frac{3}{4}$  for rent and  $\frac{1}{4}$  for rates. Find the amount of each of these latter items.
3. What is the half of three-fourths of five times seven shillings and sixpence?
4. How many times is  $\frac{1}{8}$  of £78. 6. 6 contained in £156. 13. 0?
5. Divide  $\frac{1}{3}$  of  $\frac{1}{4}$  of  $\frac{5}{8}$  by  $\frac{2\frac{1}{4} - 2\frac{1}{8}}{3}$ , and reduce the result to a decimal.
6. From  $\frac{1}{2}$  of  $\frac{7}{8}$  of 4s. 8d. take  $\frac{1}{30} - \frac{1}{32}$  of £5, and express the result as a decimal of a shilling.
7. Add  $\frac{1}{3}$  of a guinea,  $\frac{1}{3}$  of a sovereign,  $\frac{1}{3}$  of a crown,  $\frac{1}{3}$  of a shilling, and  $\frac{1}{3}$  of a penny.
8. Two persons start at the same time, one from Tamworth walking at the rate of 3 miles an hour, the other from Lichfield driving at 10 miles an hour. Where and when will they meet, the distance between the two places being  $6\frac{1}{2}$  miles?
9. Find the square root of 9000426005041.
10. If 15 cwt. 3 qrs. 21 lbs. cost £47. 16. 3, how much may be obtained for £150?

## PAPER XLI.

1. Find the Simple Interest of £216. 13. 4 for  $6\frac{1}{4}$  years at  $3\frac{1}{2}$  per cent.
2. What is the Simple Interest of £720 from March 11th to July 9th of the same year at  $7\frac{1}{2}$  per cent.?
3. Find the cost of erecting 51 yds. 1 ft. 11 in. of oaken palisades at 2s. 6d. per yard.
4. What is the cost of 38 qrs. 5 bus. 1 pk. of old wheat at 78s. per quarter?
5. How many quarters of oats are there in 307 pecks? Find their value at 1s. 3d. per peck.
6. Reduce £1. 9.  $10\frac{1}{2}$  to the decimal of £2. 14. 0.
7. Find the value of 
$$\frac{3\frac{3}{4} + 1\frac{7}{8} \text{ of } 6}{13\frac{1}{3} \times \frac{3}{16}} \text{ of } 5\frac{5}{8} \text{ of } £6. 10. 10.$$
8. Take 703 half-guineas from 703 times 5 half-crowns.

9. Divide £3. 10. 0 between two persons in such a manner that one may have 12s. 6d. more than the other. Explain the method adopted in solving this and similar questions.

10. Find the cost of 11 yds. 2 ft. 6 in. at 3s. 9d. per lineal yard.

## PAPER XLII.

1. Find by Practice the value of 11023 at £2. 17.  $11\frac{3}{4}$  each.

2. Find the value of 370·25 dollars in English money if 4·75 dollars are equivalent to the £ sterling.

3. A  $\frac{3}{4}$ -in. plank 8 inches wide contains exactly 2 cub. ft. of timber; what is its length?

4. Find the value of  $2\frac{1}{2} \times 3\frac{1}{3} \times 2\frac{1}{4}$  of  $1\frac{1}{4}$  quarters of a cwt.

5. The Simple Interest on a certain sum of money for 1 yr.  $11\frac{1}{2}$  mths. at 2 per cent. was £7. 16. 8; find the amount of principal.

6. It is proposed to give an additional six inches of depth to a part of a canal six miles long and with an average width of 25 feet. How many tons of earth must be removed for this purpose, if a cubic yard weighs  $23\frac{1}{2}$  cwt.?

7. Add  $1\frac{1}{5} + 2\frac{2}{3} + 3\frac{1}{6} + 1\frac{1}{6}$ , and divide the sum by 20·1.

8. Take  $2\frac{2}{3}$  from the sum of  $5\frac{5}{6} + 7\frac{1}{4} + 3\frac{2}{3}$ .

9. Reduce 17 m. 3 fur. 19 po. 3 yds. 2 ft. 6 in. to inches.

10. Reduce 7091036 sq. ft. to acres, and the same number of cub. in. to cub. yds.

## PAPER XLIII.

1. If 35 workmen can do a piece of work in 18 days, in what time would 210 men do the same, working only half as quickly?

2. Find the value of ·120879 of £1. 11. 0.

3. How many bricks 9 in. by  $4\frac{1}{2}$  in. will pave 3 courtyards, each 81 ft. square?

4. How many yards of carpet  $\frac{5}{8}$  of a yd. wide will be required for a room 16 ft. by 12 ft. 6 in.?

5. Find the total cost of the carpet in the preceding example if 5s. per yard be charged for it, and 3d. per foot for making, &c.

6. What money should be given with 20 yds. of silk at 11s. 10d., to pay for fourscore and ten dozen quires of paper at 5s. per ream?

7. Find the value of  $\cdot\dot{0}2\dot{7} \times \cdot\dot{0}3\dot{7}$  of 1 m. 1237 yds.

8. Reduce  $\frac{4}{5}$  of  $\frac{5}{6}$  of 7 p.  $3\frac{1}{2}$  yds. to the decimal of  $\frac{1}{17}$  of a mile.
9. *A* by working on piece-work  $\frac{1}{2}$  as fast again as *B* is able to earn 10*d.* per day more; how much does each earn per day?
10. If  $11\frac{1}{4}$  cub. yds. can be excavated in 3 days by an ordinary workman, how many such workmen, together with 13 others of  $\frac{2}{3}$  more than ordinary ability, must be employed to dig out 1317 cub. yds. of soil in a day?

## PAPER XLIV.

1. From the third part of 10 a. 1 r. 1 p. take the fifth part of 14 ac. 0 r. 25 p., and find the value of the remainder at £5 per acre.
2. If  $11\frac{3}{4}$  yds. flannel cost £1. 0.  $6\frac{3}{4}$ , find the cost of  $20\frac{1}{2}$  yards.
3. Find the Simple Interest of £210. 10. 6 for 5 years at 4 per cent.
4. By how much does 11300000 sq. in. exceed  $1\frac{1}{4}$  acres?
5. Find the value of  $\frac{1}{2}$  of  $\frac{1}{70}$  of  $16\frac{2}{3}$  s. +  $\frac{1}{3}$  of  $\frac{4}{5}$  of 9s. +  $\frac{1}{12}$  of  $\frac{9}{7}$  of 14s.
6. Find the 13th term of the series  $1 + 2\frac{1}{4} + 3\frac{1}{2} + \&c.$
7. The expenses of a Union whose total rateable value is £179800 amount to £23598. 15. 0. Find the proportionate amounts payable by each of the five parishes in the Union whose rateable values are £3021, £559. 6. 10. 0, £44320. 10. 0, £42119, and £34353, respectively.

8. If a person receiving £2. 2. 0 weekly gets an advance of 15 per cent., what will he then receive?

9. Find the whole cost of  $5\frac{1}{2}$  lbs. cheese at  $8\frac{1}{2}$ *d.*,  $7\frac{3}{4}$  lbs. bacon at  $7$ *d.*,  $3\frac{1}{2}$  stones sugar at  $4\frac{1}{2}$ *d.* per lb., 11 stones soda at  $1\frac{3}{4}$ *d.* per lb., and 18 gallons of vinegar at  $2\frac{1}{4}$ *d.* per pint.

10. From £3·1475 take £3·10475 and reduce the remainder to the decimal of 10 shillings.

## PAPER XLV.

1. Find by the rule of Practice the value of 316 articles at £2. 19. 6 each.
2. If 13 bushels cost 45s. 6*d.*, what will  $19\frac{1}{2}$  bushels cost?
3. Find the cost of  $13\frac{1}{4}$  yds. if 11 cost £2. 19. 7.
4. If 7 men, working 7 hours a day, do a certain piece of work in 8 days, how many days of 5 hours each would 10 men require to do the same?
5. What is the Simple Interest on £430. 17. 6 for 1 yr. 8 mths. at 5 per cent.?
6. Reduce 11210330 sq. ft. to acres.

7. What is the Compound Interest on £650 for 5 years at 4 per cent.?
8. Find the value of 317285 of 3 tons  $10\frac{1}{2}$  cwt.
9. By selling at 11s. 3d. I lose 10 per cent.; what was the cost price?
10. Make an invoice of the following, for which Mr Chas. Younger became indebted to Halliday & Co., of New York, on Dec. 21, 1877:  
 13769 feet of deal at  $1\frac{1}{4}$ d. per foot; 8213 feet of American Walnut at  $13\frac{1}{2}$ d.;  
 32 $\frac{1}{2}$  tons of hickory at £2. 19. 0 per ton; 13 logs, each 70ft., of Spanish  
 mahogany at  $11\frac{1}{2}$ d. per ft.; and 1990 ft. baywood at  $7\frac{1}{2}$ d.; Freight £290. 12. 0;  
 Insurance £19. 17. 6.

## PAPER XLVI.

1. A ship fired a signal to her consort which was answered after an interval of three seconds; the report of the answering gun being heard exactly  $18\frac{1}{4}$  seconds after the first gun was fired. What distance were the ships apart, sound travelling 1142 feet per second?
2. Find the cost of 118 tons of iron ore at £3. 11. 6 per ton, a discount of 5 per cent. being allowed for cash.
3. Find the Simple Interest of £209 for  $2\frac{3}{4}$  years at  $2\frac{1}{2}$  per cent.
4. If 17 steamers, each consuming 23 tons of coal daily, be employed from January 13 to March 11, 1878, what would their supply of coal cost at 9s.  $10\frac{1}{2}$ d. per ton?
5. A barrel of ale is sold for £2. 14. 0; what is the price per quart?
6. What will £550 amount to in 11 years at  $3\frac{1}{8}$  per cent. Simple Interest?
7. Reduce £3875 to account money, and 5s.  $10\frac{1}{2}$ d. to the dec. of £1.
8. Reduce 3 cwt. 1 qr. 12lbs. to the decimal of a ton.
9. If 3.125 acres cost £8.4755, what is that for 14.35 poles?
10. Find the cost of 119 articles at 2s.  $11\frac{1}{2}$ d. each.

## PAPER XLVII.

1. A King's share in the New River Co. realised £90312 and was bought by 27 persons; what was the average amount paid by each?
2. What will £500 amount to in 3 years at 5 per cent. Compound Interest?
3. The toll raised on a certain bridge amounted to £7113 during the month of April; how many people crossed daily at  $\frac{1}{2}$ d. per head?

4. What is the Simple Interest of £200 for  $4\frac{1}{4}$  years at  $2\frac{1}{2}$  per cent.?
5. How many articles at 3s.  $6\frac{1}{2}d.$  each may be bought for 480 guineas?
6. Find the cost of  $111\frac{1}{4}$  at £2. 13.  $9\frac{1}{2}$  each, by Practice and by Compound Multiplication.
7. Find the value of  $\frac{\frac{1}{2} + \frac{1}{3} + \frac{1}{4}}{\frac{1}{6} + \frac{1}{8} + \frac{1}{7}}$  of  $\frac{1}{3}\frac{1}{5}$  of 8s. 11d.
8. Reduce 4·96031 tons to its equivalent in tons, cwts., qrs., &c.
9. Express 5 lbs. 8 dwts. 3 grs. as the decimal of 5 lbs. Troy.
10. Find the Simple Interest of £7070 for  $3\frac{1}{2}$  years at  $6\frac{2}{3}$  per cent.

## PAPER XLVIII.

1. Find the value of  $\frac{2}{3}$  of  $\frac{3}{4}$  of 6s.  $7\frac{1}{2}d.$  and of 5·307 of 10s.
2. A person gives  $\frac{1}{3}$  of his money to A,  $\frac{1}{4}$  to B, and  $\frac{1}{2}$  the remainder to C, he had then  $9\frac{1}{2}d.$  left; what had he at first?
3. What would £360 amount to in  $7\frac{1}{4}$  years at  $2\frac{1}{2}$  per cent. Simple Interest?
4. Three ships bring over a cargo of rum consisting in all of 5000 puncheons each 84 gallons, the price of which is 1s.  $5d.$  per gallon, the duty is 10s.  $5d.$  per gallon, portorage 1s.  $9d.$  per puncheon, and dock dues  $4\frac{1}{4}d.$  per gallon. If sold at the retail rate of 2s. 0d. per pint, what would be the total gain?
5. When are the hour and minute hands of a clock pointing in directly opposite directions between two and three o'clock? Give reasons for the method of solution.
6. Find the cost of  $5\frac{1}{2}$  cwt. of tobacco at 3s.  $4d.$  per lb., and express the result as the decimal of £100.
7. How much should be given for  $1\frac{1}{2}$  of  $\frac{1}{3}\frac{1}{5}$  of a picce of ground measuring 50 acres at £7. 7. 0 per acre?
8. Simplify  $\frac{1 - \frac{1}{2}}{1 + \frac{1}{2}} + \frac{3}{8} \times 8\frac{1}{2}$  of  $\frac{3}{17}$ . What is meant by the "reciprocal" of a number? Give the reciprocals of 3,  $\frac{9}{7}$  and ·5.
9. Bought goods for £50, sold  $\frac{1}{2}$  at a gain of 20 per cent.,  $\frac{1}{3}$  at gain of 10 per cent., charged £6 $\frac{2}{3}$  for the remainder; how much per cent. is lost or gained on the whole?
10. One-fourth of a garden containing  $1\frac{3}{4}$  acres is planted with potatoes,  $\frac{7}{8}$  with cabbages,  $\frac{1}{12}$  with various vegetables, and the remainder is occupied by paths. What is the length of the paths if they have an average breadth of 5 feet?

## PAPER XLIX.

1. From  $11\frac{3}{4}$  lbs. Troy take  $11\frac{3}{4}$  oz. Avoir. and multiply the remainder by 8.
2. Find the cost of 19 lbs. 4 oz. Avoir. at  $\cdot 11d.$  per lb.
3. Find the Simple Interest on £39. 12. 6 for 5 years at  $2\frac{1}{2}$  per cent.
4. How many cwts. may be bought for £45. 1.  $10\frac{1}{2}$  at £4. 17. 6 per ton?
5. If 11 horses require  $5\frac{1}{2}$  tons of hay in 5 weeks, what weight would be required by 99 horses in 7 days?
6. Find the Compound Interest on £50 for  $3\frac{1}{2}$  years at 2 per cent. half-yearly?
7. What is the cost of 3 cwt. 2 qr. 12 lbs. at  $20s. 6d.$  per ton?
8. Simplify  

$$(10 - 9\frac{8}{15}) \times \frac{\frac{5}{6} \times \frac{1}{4}\frac{7}{9}}{1\frac{1}{4}\frac{6}{9} \times 7} \text{ of } \frac{1\frac{3}{4} \text{ of } 287}{8\frac{3}{5}}.$$
9. Express 5 per cent. of £11. 11. 6 as the decimal of a pound.
10. Find the difference between the Simple and Compound Interest of £300 for 4 years at 3 per cent. quarterly.

## PAPER L.

1. Find the cost of  $15\frac{1}{2}$  dozen, threescore, and three at  $7s. 9\frac{1}{4}d.$  for 6 dozen and 11.
2. Reduce  $\cdot 041\dot{6}$  to a vulgar fraction. Give the rule for reducing recurring decimals to their equivalent vulgar fractions.
3. Find the value of  $3\cdot 80215$  tons +  $5\cdot 1125$  cwts. -  $21\cdot 75$  lbs.
4. If 5 men do a piece of work in 11 half-hours, how long would it take 8 men to do three times the work, working at  $\frac{2}{3}$  of the rate?
5. From  $\cdot 0314$  take  $\cdot 007$  and find the value of the remainder at the rate of £61 for 3·05.
6. Divide  $3\cdot 071$  by  $\cdot 003071$ , and find the value of £31·8765.
7. If  $\frac{1}{2}$  of  $\frac{2}{3}$  of a share in an undertaking cost £70. 7. 1, find the value of  $\cdot 28125$  of a share.
8. If 15 horses consume 11 bushels of corn in 9 days, how long would 44 bushels last 45 horses?

9. Reduce to the simplest form

$$\frac{1}{\frac{1}{2} + \frac{1}{\frac{1}{2} + \frac{1}{\frac{1}{2}}}} \text{ of } \frac{13\frac{1}{4} \text{ of } 5\frac{1}{2}}{1\frac{2}{3} \text{ of } 1\frac{1}{3} \text{ of } 53}.$$

10. If *A* does a piece of work in 3 days which *B* can do in 4 days, in what time would they do it working together?

#### PAPER LI.

- Find the Circulating Decimals of  $\frac{1}{7}$  and  $\frac{1}{13}$ . Define the terms *proper*, *compound* and *complex* as applied to Vulgar Fractions.
- How many square yards are there in  $9\frac{1}{4}$  square miles?
- Find the entire cost of:—11 yds. calico at  $6\frac{3}{4}d.$ , 19 do. at  $7\frac{1}{2}d.$ , 13 yds. flannel at  $1s. 7d.$ , and  $56\frac{1}{4}$  yds. chintz at  $10\frac{1}{2}d.$
- A wheel of a locomotive 4 ft. in diameter, making 300 revolutions per minute, is travelling for 4 hrs. 10 min.; how far does it go in that time?
- It is estimated that light travels at the rate of 192500 miles per second. What time would a ray of light take to traverse the distance from the Sun to the Earth (91 millions of miles)?
- Find the Simple Interest of £474 for 5 years 3 months at 4 per cent.
- From the sum of  $3\frac{1}{10}$  and  $1\frac{1}{11}$  take half the difference. What is the effect of multiplying (i) the numerator, (ii) the denominator of a fraction by a whole number.
- Find the value of  $\frac{7}{8}$  of £2 +  $\frac{1}{2}$  of 5 florins +  $\frac{2}{7}$  of half a guinea +  $\frac{1}{5}$  of half a crown.
- What is the amount of £316 for 9 years  $2\frac{1}{2}$  months at  $3\frac{1}{2}$  per cent. per annum Simple Interest?
- Find the difference of the Simple and Compound Interest of £200 for 5 years at 5 per cent. per annum.

#### PAPER LII.

- If 37 men can do a piece of work in 91 days of 9 hours each, by how many hours per day should the working time be increased so that 333 men could at the same rate do the work in 8 days?
- If the carriage of 110 cwt. for 66 miles amounts to £1. 2. 0, what should be the cost of carriage of 11 tons for 80 miles?
- In what time would £390. 10. 0 amount to £524. 4.  $11\frac{1}{10}$  at 3 per cent. Simple Interest?



4. What should be charged for goods so as to gain  $29\frac{1}{4}$  per cent. if by selling at a certain price 19 per cent. is gained, and by selling for £3. 11. 9 $\frac{1}{4}$  less,  $13\frac{1}{2}$  per cent. is lost?

5. What sum placed out at Compound Interest for 5 years at 4 per cent. will gain £151. 13. 1 $\frac{1}{2}$ ?

6. Bought eggs at 1s. 3d. per score; how many may be sold for a shilling so as to gain  $12\frac{1}{2}$  per cent.?

7. Find the Compound Interest on £1500 for 4 years at 4 per cent.

8. At £2 per ton find the value of 3 cwt. 3-6428571 qrs.

9. If goods be bought for £10. 2. 6 with 3 months credit, at what price should they be forthwith sold with 9 months credit so as to gain 15 per cent. on the cost price, reckoning interest at 5 per cent.?

10. A square field 800 yards long is let at £8 per acre; what rent should be charged for a part one-fourth as long and also square at an advance of 20 per cent. on the rate for the whole?

## PAPER LIII.

1. The rent of a farm of 630 ac. 3 ro. 20 po. is £5 per acre, and the rates amount to 2s. in the £. on the rental; what does the tenant pay altogether?

2. A train 80 yards long, travelling at the rate of 30 miles an hour, passes another 30 yds. long travelling in an opposite direction in 5 seconds, at what rate per hour was the latter train running?

3. A person gave to *A*  $\frac{1}{2}$  his money, to *B*  $\frac{1}{3}$  what was left, to *C*  $\frac{1}{4}$  of the remainder, and had then 2s. 7 $\frac{1}{2}$ d. left; what had he at first?

4. Find the total cost of 111 $\frac{1}{4}$  yds. flannel at 1s. 6d., 23 $\frac{3}{4}$  do. at 2s. 8d., 7 yds. cambric at 9s. 10d., 18 $\frac{1}{4}$  yds. linen at 2s. 9d., 13 doz. handkerchiefs at 11 $\frac{3}{4}$ d. each, and 51 yds. calico at 6 $\frac{3}{4}$ d.

5. Bought 13 cwt. 2 qrs. at £2. 10. 0 per cwt. and sold so as to gain five guineas in all; what was the selling price per lb.?

6. Find the cost of 101 m. 3 fur. 110 yds. at £4. 10. 0 per mile?

7. Express  $\frac{1}{7}$  as a Recurring Decimal, and  $500\frac{1}{4}$  as a Vulgar Fraction.

8. A paper making machine throws off 3 rolls of paper each 4 miles 240 yds. in  $1\frac{1}{2}$  hours; what total length would 5 machines throw off in a week of 6 days, working day and night?

9. How many reels of cotton at 1s. 10d. per dozen may be bought for £11?

10. Find the value of 19 tons 11 cwt. 1 qr. 7 lbs. at 12s. 6d. per ton?

## PAPER LIV.

1. In the latitude of Derby a degree measures 365000 English feet, reduce this to miles, &c., and express it as a decimal of  $69\frac{1}{10}$  miles.

2. The French toise is equivalent to 1.94904 metres and a metre = 1.0936331 English yards; express a toise in English yards.

3. The earth is spheroidal in form having a major axis of 41847400 feet from East to West, and a minor axis of 41707600 feet passing through the poles from North to South. Find the amount of flattening at each pole in miles, &c.

4. Bought goods at £31. 10. 0, at what price should they be sold to gain  $7\frac{1}{2}$  per cent.?

5. Express the sum of  $1\frac{1}{2}$  yds. +  $1\frac{1}{2}$  ft. +  $1\frac{1}{2}$  in. as the decimal of a yard.

6. Find the true discount on a bill of £4700 due 5 months hence at  $4\frac{1}{2}$  per cent.

7. Simplify

$$\left\{ \frac{2\frac{2}{3} + (1\frac{1}{9} \text{ of } \frac{7}{11})}{11\frac{2}{3} - (\frac{1}{2} \text{ of } 7\frac{1}{3})} \div \frac{5\frac{1}{2} \times (3\frac{1}{2} - 1\frac{2}{3})}{16\frac{1}{2} + 3\frac{2}{3} \text{ of } \frac{7}{5}} \right\} + \frac{11\frac{1}{3} \text{ of } 3\frac{1}{6} \text{ of } 1\frac{1}{2}}{89 \times \frac{7}{5} \text{ of } 4}.$$

8. Express  $31^{\circ} 3' 30''$  as a decimal of the circumference of a circle, correct to five places.

9. Find the square root of 316 and the cube root of 423, correct to five places of decimals.

10. Find the value of  $\frac{1}{2}\frac{7}{8}$  of 133 ac. 3 r. 36 po.

## PAPER LV.

1. Divide a guinea and a half between *A*, *B* and *C*, giving *A* three times as much as *B*, and *C*  $\frac{1}{2}$  as much as *A* and *B* together.

2. Find the value of  $\frac{1}{3}$  of 5s. 0d. +  $\frac{2}{5}$  of 7s. 6d. +  $\frac{5}{8}$  of £2. 10. 0 +  $\frac{9}{10}$  of 3 guineas -  $\frac{8}{9}$  of 11s. 3d. Prove the rule for the division of Vulgar Fractions.

3. A clock which gains uniformly ten seconds per hour is set right at 6 p.m. on April 22, when will it again denote correct time?

4. Divide £1155 amongst 17 men and 13 boys, giving 3 boys as much as 2 men.

5. Reduce .37025 of an acre to square yards.

6. From £.062725 + £3.005 take the sum of 15.825s. + 51.25d.

7.  $A$  and  $B$  are 59 miles apart when they commence walking towards each other,  $A$  going 1 mile and 1 furlong faster than  $B$  per hour; they meet in 8 hours. What are their respective rates of travelling?

8. A house cost £450, the rates amount to 2s. in the £. on the rent, and the repairs cost £9 annually. At what rent must it be let to gain 10 per cent. yearly?

9. What was the prime cost of an article which on being sold at a gain of  $7\frac{1}{2}$  per cent. yields 2s. 1d. more than if it were sold at  $12\frac{1}{2}$  per cent. loss?

10. A person paid for 5 tons of hay with a bill of £20. 5. 0 due in 3 months. Reckoning discount at 5 per cent. what was the ready money price of the hay per ton?

## PAPER LVI.

1. Find the value of  $\cdot 07$  of a ton  $+ \cdot 95$  cwt.  $+ \cdot 125$  lbs.

2. If a ration of 20 oz. of provisions be served out to each soldier daily, what length of time would 1500 tons of provisions last 32000 troops?

3. The circumference of a circle is to its diameter as  $3\cdot 1416 : 1$ ; find the circumference of a circle whose diameter is 4 ft. 6 in.

4. A person lends £200 for 3 years at 5 per cent. Simple Interest; for how long should £490 be lent at 2 per cent. to obtain the same interest?

5. If 150 workmen excavate a piece of ground 30 yds. long, 15 ft. broad, and 7 ft. 6 in. deep in 8 days of 9 hours each, how long would 90 men require to dig out a piece of ground 200 yds. long, 6 yds. broad and 10 ft. deep, working 8 hours per day?

6. A cistern holding a thousand gallons can be filled by a pipe in 20 minutes and emptied by another in 50 minutes; if both these pipes be opened when the cistern is empty, how many gallons will it contain at the end of 30 minutes?

7. If  $A$  can do a piece of work in 6 hours which  $B$  can do in 10 hours, how long would it take  $B$  to complete the work if both were employed on it the first hour and then  $A$  was withdrawn?

8. At what price should a tradesman mark goods which he sells for 15s. 0d., at a reduction of 25 per cent.?

9. Divide six shillings between  $A$ ,  $B$  and  $C$ , giving  $A$   $\frac{1}{2}$  as much as  $B$ , and  $B$   $\frac{1}{3}$  as much as  $C$ .

10. Find the value of £371  $+ \cdot 316$ s.  $+ \cdot 285$  half-crowns  $+ \cdot 618$  pence.

## PAPER LVII.

1. What is left after deducting  $6\frac{2}{3}$  per cent. of a bill of £15. 3. 9?
2. Find the difference between the Simple and Compound Interest of £450 for 11 years at 4 per cent.
3. What number is that to which if twice its value be added, the fourth part of the sum is  $4\frac{1}{2}$ ?
4. If a certain piece of work can be done by 11 men working at a certain speed in 43 hours, how long would it take the remainder to complete it if after 24 hours work 3 men be taken off but the speed is increased by  $\frac{1}{3}$ ?
5. Find the True Discount on a bill of £40 due in 3 months at 4 per cent. per annum. Show that the difference between True and Ordinary Discount is the Interest on the True Discount.
6. *A* starts from Plymouth by road at the rate of  $3\frac{1}{2}$  miles an hour to walk to London (246 miles), and is followed after an interval of 14 hours by *B* going on horseback at the rate of  $10\frac{1}{2}$  miles an hour. At what distance from Plymouth, and in what time from starting will *A* be overtaken?
7. Reduce 37003151 Troy grains to Avoirdupois weight.
8. Express  $\cdot 932\bar{1}4$  as a Vulgar fraction.
9. Find the value of  $\cdot 3475$  of £5. 10. 0.
10. Find the value of  $3\cdot 03 \times 71\cdot 09 \div 7\cdot 15$ .

## PAPER LVIII.

1. Find the prime cost per ton of hay, 11 tons of which were sold for £50. 12. 0 at a gain of 15 per cent.
2. If 14 men do a piece of work in 5 days of 8 hours each, how many men each doing  $\frac{1}{3}$  more work would be required to do the same piece of work in 3 days of 10 hours each?
3. *A* can do a piece of work in 5 hours, *B* in 6, and *C* in 7 hours; in what time could they do it working together?
4. Find the average of  

$$\sqrt{371}, \sqrt[3]{291}, \sqrt[3]{791}, \sqrt{216}, 7\sqrt[3]{417}$$
correct to five places of decimals.
5. Find the True discount of a bill of £120 due in 1 year 3 months, reckoning discount at  $3\frac{1}{2}$  per cent. per annum.

6. Find the difference between the Simple and Compound Interest of £1100 for 3 years at  $3\frac{1}{2}$  per cent.
7. Simplify  

$$\frac{\frac{1}{17} \times \frac{1}{11}}{1\frac{1}{17} \text{ of } 1\frac{1}{11}} \text{ of } \frac{\frac{3}{4} \text{ of } 7\frac{2}{3}}{1\frac{3}{8} \times \frac{2}{5}} \text{ of } 5 \text{ cwt. } 1 \text{ qr. } 1 \text{ lb.}$$
8. A certain number multiplied by 7, and divided by 12, gives  $\frac{1}{2}$  of  $\frac{1}{2}$  of the sum of 4.265, and 42.6; find it.
9. Find the value of .70875 of 8 lbs. Troy.
10. Reduce 3 cwt. 1 qr. 21 lbs. to the decimal of a ton.

PAPER LIX.

1. How much tea at 3s. 4d. per lb. must be mixed with  $20\frac{1}{2}$  lbs. at 3s. 10d., so that if the mixture be sold at 4s.  $1\frac{1}{2}$ d. per lb. there may be a gain of  $11\frac{1}{2}$  per cent. on the whole?
2. A bankrupt's assets amount to £9630, and he can pay 17s. 10d. in the £. What amount of debt remains unpaid?
3. Simplify  

$$\left\{ \frac{5}{7} \text{ of } \frac{7}{4\frac{1}{3}} + \frac{5\frac{1}{2} \times \frac{1}{5}}{3\frac{2}{3}} \right\} \text{ of } £1. 10. 0.$$
4. Find the cost of 11.7875 tons at £3.1475 per cwt.
5. If 13 be added to the half of a certain number, one-fourth of the sum is 12.625; find the number.
6. Find by Practice the value of 13 lbs. 5 oz. 10 dwts. 12 grs. at £1 per oz.
7. By selling an article at £4. 7. 6 I lose  $12\frac{1}{2}$  per cent.; at what price should I sell it so as to gain  $16\frac{1}{3}$  per cent.?
8. A broker charges  $\frac{1}{3}$  per cent. commission on a certain transaction. He gains altogether £27. 18. 9. What was the amount of the transaction?
9. Reduce  $\frac{1}{13}$  to a recurring decimal, and  $\frac{1}{11}$  of £1 to the fraction of 5s. 6d.
10. Find the cube root of 5000211000. Give the rule for extracting the cube root.

PAPER LX.

1. When the barometer stands at 30 inches and the Fahrenheit thermometer at  $62^{\circ}$ , a cubic foot of water weighs 62.3210608 lbs. Avoirdupois. From this, determine the solid content of a block of granite weighing 186 tons, the specific gravity of granite being 2.688.

2. Find the sum of the series  $1 + 3\frac{1}{2} + 5\frac{1}{2} + \&c.$  to 11 terms.
3. The Earth's Equatorial Radius is 20921665, and its polar radius 20852394 English feet. Express the difference in English miles.
4. Write down the 2nd power of 376, and the 3rd power of 416.
5. Find the difference between Banker's and True Discount on a bill of £400 due in 9 months, reckoning discount at 4 per cent.
6. Find the Compound Interest on £310 for  $3\frac{1}{2}$  years at 3 per cent. quarterly.
7. A person places £150 yearly in the bank for 7 years. What amount has he at the end of that time reckoning Simple Interest at the rate of 5 per cent.?
8. A solar year consists of 365 days 5 hours 48 min. 49·536 seconds. Express this as the decimal of a day.
9. Find the present worth of £3160 due 9 months hence, discount being at  $3\frac{1}{2}$  per cent. per annum.
10. A invests £4000 in the  $3\frac{1}{2}$  per cents. at 94: what is his income?

## PAPER LXI.

1. In how many years will £300 amount to £326 at a certain rate of interest if £460 amounts to £526 in  $6\frac{1}{2}$  years at the same rate?
2. Sold  $\frac{1}{3}$  of my goods so as to realize the prime cost of the whole, and the remainder for £7. 10. 0, thus losing on this portion 25 per cent. of cost price. Had I sold the whole for £20. 10. 0, what would have been my gain or loss per cent.?
3. A vessel steaming at a uniform rate of 11 knots (each 2000 yards) an hour fires a gun for her consort. The report is heard by the crew of the latter vessel 12 seconds after the flash is seen. At what rate per hour in miles must they steam to overtake the first vessel in 3 hours, if sound travels 1100 feet per second?
4. Find the Bank discount of a bill of £474 due in 219 days at 4 per cent.
5. Bought 50 copies of a work, part at 3s. 6d. per copy, and part at 5s. Paid in all £10. 17. 0. How many of each edition did I buy?
6. Reduce 17 per cent. of £10. 16. 8 to the decimal of half-a-sovereign.
7. A town has at present 11510 inhabitants, during the past 10 years it has lost 22·7 per cent. by deaths and removals, and has gained 37·8 per cent. by births, &c. What was the population 10 years ago?

8. Find the Compound Interest on £50 for 7 years at 3 per cent.
9. What principal at  $3\frac{1}{2}$  per cent. Simple Interest will amount to £640 in 8 years?
10. Express  $\frac{1}{7}$  of  $\frac{2}{3}$  of 13s. 4d. as a decimal of £2.

## PAPER LXII.

1. If I gain 15 per cent. by selling an article for £8. 12. 6, what was the cost price?
2. Find the Compound Interest of £320 for  $3\frac{1}{2}$  years at 3 per cent. half-yearly.
3. In what time will £300 amount to £365 at 5 per cent. per annum Simple Interest?
4. Reduce  $302\frac{1}{2}$  lbs. Troy to Avoirdupois weight, and express 1 oz. Troy as a decimal of 1 lb. Avoirdupois.
5. If a kilogram is equivalent to  $2\frac{1}{6}$  English lbs. Avoirdupois, express in kilograms one-fourth of a ton.
6. A cistern capable of holding 637 gallons can be filled in 40 minutes by a supply pipe and emptied in 25 minutes by a discharge pipe. If both be set running when the cistern is full, in what time will it be emptied?
7. Reduce  $11103\frac{1}{2}$  chains, each 66 feet to miles.
8. Find the value of 15 per cent. of 40 guineas.
9. Find the present value of a bill due in 30 days, worth then £300, if discount be reckoned at 4 per cent.
10. Find the value of

$$\frac{3\frac{3}{4}}{12\frac{3}{4}} \text{ of } \frac{1\frac{4}{13}}{2\frac{1}{3}} \text{ of } \frac{3\frac{1}{2}}{1\frac{1}{6}}$$

and express the result as a decimal fraction.

## PAPER LXIII.

1. Reduce 1109163 square inches to poles.
2. Find the Simple Interest of £702. 11. 3 for  $5\frac{1}{2}$  years at 3 per cent.
3. Bought 30 pairs of gloves, some at 2s. 6d., some at 3s. 6d. per pair; spent £4. 12. 0 in all. How many of each kind did I buy?
4. In what time will £905 amount to £995. 10. 0 at  $3\frac{1}{2}$  per cent. per annum Simple Interest?

5. Find the difference between the Simple and Compound Interest of £700 for 7 years at 4 per cent.

6. Reduce  $1\frac{1}{4}$  to a decimal fraction.

7. Bought oranges half at 2 a penny, and the remainder at 3 a penny. Sold the whole at 5 for 2d. What do I lose or gain per cent.?

8. Bought goods at £3 per ton; at what price per cwt. should they be sold so as to gain 15 per cent.?

9. Find the cube root of 751337340571.

10. A person walks from Uppingham to London in 4 days, and back in 5 days, going each day one mile less than on the day preceding. What is the distance from Uppingham to London?

#### PAPER LXIV.

1. The time is between 2 and 3 o'clock when the minute-hand of a watch intercepts an angle of  $90^\circ$  with the hour hand. What is the exact time?

2. What number added to  $\frac{1}{108}$  of  $3\frac{1}{18}$  will give unity?

3. A circular estate is left to 5 sons. The diameter of the whole estate is  $1\frac{1}{2}$  miles. Each of 4 sons is to receive a share equal to a circle whose radius is 400 yards, and the eldest the residue. What is the share of each, the area of a circle being  $\cdot7854$  times the square of the diameter?

4. The diameter of the driving wheel of a locomotive is 5 feet 9 in.; how many revolutions would it make in travelling from London to Manchester, 183 miles? The ratio of diameter to circumference in a circle is as 1 : 3·1416.

5. How many planks  $1\frac{1}{2}$  ins. thick by 10 ins. wide, can be cut from 17 logs each 1 ft. 8 in. square, and 19 ft. long?

6. The French litre =  $\cdot22009687$  English Imperial gallons. Express 52030 litres in English Imperial measure.

7. Simplify

$$\frac{\cdot071 + \cdot0385}{\cdot71 - \cdot007} \div \frac{3\cdot14153 \div 70}{\cdot041 \times \cdot015}.$$

8. The Cambridge crew rowed from Putney to Mortlake a distance of  $4\frac{1}{2}$  miles in 23 minutes 20 seconds. What was the rate per hour?

9. Find the value of  $3\frac{3}{4}$  of  $7\frac{1}{2}$  of £2, and reduce the result to the decimal of £100.

10. Find the Compound Interest of £300 for 11 years at 3 per cent.



PAPER LXV.

1. The engine of a train having a driving wheel 9 feet in diameter is making 180 strokes per minute. At what rate per hour is the train travelling?

2. A certain corporation borrows £4000 on the security of the rates on the property within the borough, proposing to repay the loan in ten equal yearly instalments together with interest at the rate of 5 p. c. each year on the outstanding balance. What amount would be paid altogether?

3. Supposing in the preceding example the rateable value of the property to be £50000; what rate in the £, each year, would suffice to pay principal and interest?

4. Find the value of 3·031 times 3·031 of 5 years 130 days.

5. Find the Cube Root of 239483061, and of ·000002197.

6. Having sold 15 yds. of cloth for £1. 13. 9 and thereby lost 10 per cent., find the cost price per yard.

7. Find by the Rule of Practice the value of 37° 16' 30" at 63 m. 3 fur. 120 yds. for each degree.

8. Find the Simple Interest of £300 for 1·85 years at 3·64 per cent.

9. Find the true discount on a bill of £713 due in 219 days at 5 per cent.

10. Find the value of  $\sqrt{928} + \sqrt[3]{360} + 4\sqrt[3]{715}$ .

PAPER LXVI.

1. What is the value of  $·019\dot{7}\dot{6} + (3·0\dot{3} \times 5·2\dot{0}\dot{7}) - 12·1\dot{2}0\dot{2}$  correct to 4 places?

2. Reduce 3·04165 tons to its equivalent in tons, cwt., &c.

3. A certain number on being divided by ·091 and the quotient multiplied by ·35 gives 38. Find the number.

4. By what would my income differ if, instead of investing £6631 in the 3 per cents. at 87½, I had invested that sum in the 4 per cents. at 95?

5. In what time will £7300 amount to £7619 at 2½ p. c. per annum Simple Interest?

6. If the 3 per cents. may be bought at 88½, what should be the price of the 4 per cents.?

7. At what rate per cent. will £446 amount to £490. 12. 0 in 3 years, Simple Interest?

8. What is the value of  $\cdot 371625$  of a year?

9. Simplify

$$\frac{3\frac{1}{2} \text{ of } 10\frac{1}{2} \text{ of } 27}{1\frac{1}{3} \text{ of } 1\frac{1}{8}} \text{ of } \frac{5\frac{2}{3} \text{ of } \frac{1}{2}}{\frac{5}{2} \times \frac{1}{8}} \text{ of } \pounds 1.$$

10. In what time will  $\pounds 365. 12. 6$  amount to  $\pounds 401. 11. 3$  at  $3\frac{1}{2}$  p. c. per annum Simple Interest?

#### PAPER LXVII.

1. If 5 lbs. of cherries be worth 12 lbs. of pears, and 8 lbs. of pears are worth 15 lbs. of apples, and  $1\frac{1}{2}$  stones of apples cost 2s. 4d.; find the cost of 10 stones of cherries.

2. Bought tea at  $\pounds 10. 16. 0$  for a chest of 96 lbs. and sold it at 2s. 8d. per lb. What did I gain per cent., and what was my gain on the sale of 3 cwt. 3 qrs.?

3. The Fahrenheit thermometer marks freezing point at  $32^{\circ}$ , and boiling point at  $212^{\circ}$ . The Centigrade freezing point is zero and the boiling point  $100^{\circ}$ . What degree of Fahrenheit corresponds to  $70^{\circ}$  Centigrade?

4. A surveyor reads on his vernier at one sight  $17^{\circ} 14' 30''$ , at another  $25^{\circ} 3' 28''$ ; find the contained angle. "The three interior angles of every triangle are together equal to two right angles." Find the angles of a triangle which stand in the ratio of 7, 8, and 9 respectively.

5. There are three numbers in the ratio of  $\frac{1}{3}$ ,  $\frac{1}{4}$ ,  $\frac{1}{2}$ , their sum is 861. Find them.

6. How many acres can be mowed by 11 men in 3 days if 9 men can mow 15 acres in 5 days?

7. Find the value of  $\sqrt{315} + \sqrt[3]{144} + \sqrt[4]{576}$  correct to six places.

8. A, B, and C are in partnership; A puts in  $\pounds 300$  for 3 months, B  $\pounds 400$  for 4 months, and C a certain sum for 6 months. They gain altogether  $\pounds 120$ , of which B receives  $\pounds 40$ . Find A's gain and C's stock.

9. Multiply  $\frac{2}{3}$  of  $\frac{2}{7}$  of  $\pounds 5. 10. 3$  by  $\cdot 025$ , and express 3 per cent. of the result as a decimal of half a guinea.

10. A clock gains 5 seconds in every hour it indicates. How should it be set at 6 p.m. on Saturday so as to denote correct time at 9 a.m. the following Monday?

#### PAPER LXVIII.

1. I buy pears at 3 for a penny and an equal number at 4 for a penny. I sell all at 7 for 2d. thereby losing a shilling. With how many do I trade?

2. Find the value of  $\sqrt{\cdot 316} - 3\sqrt[3]{\cdot 000316}$ .

3. A sovereign is divided amongst  $A$ ,  $B$  and  $C$ .  $A$  has  $\frac{2}{3}$ ,  $B$   $\frac{1}{3}$  of the remainder, and  $C$  what is left. Express  $C$ 's share as a decimal of  $A$ 's.

4. Goods which cost £31. 0. 10 are sold at a gain of 19 per cent. Find the selling price.

5. Find the true discount upon a bill of £76. 6.  $2\frac{3}{4}$  due in 37 days, discount being at  $3\frac{1}{2}$  per cent.

6. A person having spent  $\frac{5}{8}$  of his income in a twelvemonth besides paying £20 rent finds that the remainder at  $4\frac{1}{2}$  per cent. yields him three guineas. What was his income?

7. A bankrupt's assets valued at £2250 are  $7\frac{1}{2}$  per cent. of his liabilities. What does he owe, and what could he pay to a creditor for £225?

8. Find the sum of the series  $1\cdot03 + 1\cdot36 + 1\cdot69$  &c. to 17 terms.

9. Divide 1300 into three parts having the ratio of 17, 19 and 29, and into three parts having the ratio of 11, 1·1 and ·9.

10. Divide 147 into two parts so that  $\frac{4}{5}$  of the one shall be  $\frac{5}{6}$  of the other.

## PAPER LXIX.

1. The gradient of a line of railway between two towns 18 miles apart is 1 in 120 descending, for the first  $7\frac{1}{2}$  miles, the line then runs level for  $4\frac{3}{4}$  miles, and rises 1 in 400 for the remaining distance. What is the difference in level of the two places?

2. Find the difference between the Simple and Compound Interest of £300 for  $3\frac{1}{2}$  years at  $2\frac{1}{2}$  per cent. half yearly.

3. If 11 men do a piece of work in 9 days of 8 hours each, how many hours per day would 56 men work to do four times as much in 12 days?

4.  $A$  can do a piece of work in 15 days,  $B$  in 18 days. They work together for 3 days, when  $A$  leaves; in what time can  $B$  finish the work?

5. Simplify

$$\frac{\frac{1}{5} + 2\frac{2}{5} \text{ of } \frac{3}{4}}{\frac{5}{2} - 1\frac{1}{10}} + \frac{11\frac{1}{3} \times 8\frac{1}{3}}{3\frac{2}{3} \div \frac{7}{9}} \text{ of } £5. 10. 0.$$

6. Goods cost £20. 10. 0 per ton and are sold at a gain of 15 per cent. Find the selling price per cwt.; and the gain on 11 tons 3 cwt. 3 qrs.

7. If I sold £8000 stock out of the 3 per cents. at 75 and invested the proceeds in the 4 per cents. at 96, what would be the difference of my income?

8. Bought articles some at 3 a penny and an equal number at 4 a penny. Sold the whole at 7 for 2d. What did I lose or gain on 7 gross?

9. Reduce 1145 cwts. to Troy Weight.
10. Divide 1241 into parts which shall be to each other as the ratio of 4, 6, 7.

## PAPER LXX.

1. What is the True discount of a bill of £375 due in 60 days at 4 per cent.?
2. How many yards of cloth may be bought for £130. 13. 4 if  $19\frac{3}{4}$  yds. cost £6. 11. 8?
3. Find the value of the series  $1\frac{2}{3} + 4 + 6\frac{2}{3} + \&c.$  to 14 terms.
4. A person exchanges £5070 stock from the 3 per cents. at 85 to the 4 per cents. at 92. What is the difference in his income?
5. The Interest on a certain sum at 3 per cent. per annum is 5s. 6d. for a calendar month. Find the principal.
6. By selling at 26s. I lose  $12\frac{1}{2}$  per cent.; at what price should I sell to gain 10 per cent.?
7. The present worth of a certain sum due 11 months hence is £316. Find the sum reckoning discount at 4 per cent.
8. Find the difference between Banker's and True discount on a bill of £479. 16. 0 due in 30 days at 5 per cent.
9. A person sells half his stock at double its cost price and the remainder at half its cost price. He thus gains £11. 10. 9. What does he receive for the whole?
10. The hands of a watch intercept an angle of  $30^\circ$  between 10 and 11 o'clock. What is the time?

## PAPER LXXI.

1. A person having had his wages increased 15 per cent. is now in receipt of £2. 17. 6 weekly. What per centage must be taken off this sum to reduce his wages to their original amount?
2. A degree of longitude causes a difference of 4 minutes in time; what is the difference in time of two places situate  $30^\circ 45' 30''$  of longitude apart?
3. Reckoning 4 minutes *before* Greenwich mean time for every degree East, and 4 min. *after* for every degree West of Greenwich, find the time in the following capitals when Greenwich mean time denotes 12 noon. St Petersburg,  $30^\circ 20'$  East longitude; Berlin,  $13^\circ 24'$  East; Paris,  $2^\circ 20'$  East; Dublin,  $6^\circ 16'$  West; and New York,  $73^\circ 58'$  West Long.

4. Divide  $\cdot 3103$  by  $\cdot 07\bar{1}$ ; and give the quotient as the decimal of  $5\cdot 051$ .
5. Find by Practice the weight of 13 cub. yds. 18 ft. 864 in. at 1 ton  $10\frac{1}{2}$  cwt. per cub. yard.
6. If 16 horses consume  $11\frac{1}{2}$  bushels of corn in 8 days, how much corn would be consumed by 48 horses in 56 days?
7. Find the length of an arc of  $23^{\circ} 12' 30''$  reckoning 68 miles to each degree.
8. Find the value of  $\pounds 1\cdot 115 + 1\cdot 26s. + \cdot 375d.$
9. If  $\frac{3}{11}$  of a share be worth  $\pounds 51. 15. 9\frac{3}{4}$  find the value of  $2\frac{1}{2}$  shares.
10. What degree of the Centigrade thermometer corresponds to  $40^{\circ}$  Fahrenheit, and what degree Fahrenheit to  $30^{\circ}$  Centigrade? (*See Paper LXVII. 3.*)

## PAPER LXXII.

1. Find the continued product of  $244\cdot 146$ ,  $625$ ,  $\cdot 15625$ ,  $1\cdot 024$  and  $\cdot 0256$ .
2. From the sum of the fractions  $\frac{2}{3}\frac{5}{7}$  and  $\frac{3}{5}\frac{5}{7}$  take their difference.
3. If a certain sum of money be divided among a certain number of persons, each will get 7s. If the number of persons be increased by 6, each will get 2s. less. How much money was to be divided?
4. Find the cube root of  $2197354919110343$  and the square root of  $\cdot 00848241$ .
5. Sold 19 yards of cloth at 11s. per yard, thus gaining the cost price of 5 yards. Find the cost price per yard.
6. What number multiplied by the twenty-fourth part of itself will give 216 as the result?
7. Having paid an income-tax of 6d. in the  $\pounds$  out of my income, I find I have  $\pounds 245. 9. 1\frac{1}{2}$  left. What amount of tax did I pay?
8. Divide  $\pounds 1. 19. 0\frac{1}{2}$  between two persons, giving one  $3\frac{3}{4}d.$  less than half as much again as the other.
9. Goods which originally cost  $\pounds 30. 8. 4$  for 2 tons 7 cwt. are sold at a gain of  $17\frac{1}{2}$  per cent. Find the selling price per cwt.
10. Simplify

$$\frac{\cdot 07692\bar{3}}{\cdot 037} \times \frac{999}{\cdot 027} \times \frac{\cdot 001}{111} \times \frac{13}{\cdot 009}.$$

## PAPER LXXIII.

1. Find the value of  $13\sqrt{78} + 5^3\sqrt{39} + \sqrt[4]{576}$  correct to 5 places of decimals.

2. Multiply 3.03 by .0313, and divide the result by .025.
3. Find the difference between placing £440 out at Compound Interest for  $4\frac{1}{2}$  years at 5 per cent. half-yearly, and investing an equal amount for the same time in Railway Preference Stock at  $46\frac{2}{3}$  premium, which yields a half-yearly dividend of  $7\frac{1}{2}$  per cent.
4. What income should I derive from an investment of £6990 in the 3 per cents. at  $87\frac{3}{8}$ ? How much must be invested in the 4 per cents. at 112 to yield an equal sum?
5. What sum paid now would meet a bill of £230 due in 146 days, discount being at the rate of  $2\frac{1}{2}$  per cent. per annum?
6. What sum must be invested in  $3\frac{1}{2}$  per cent. stock at 95 to produce an income of £175?
7. If 5 men or 16 boys can do a piece of work in 11 hours, in what time could 3 men and 48 boys do the same work?
8. A can do a piece of work in 5 hours, B in 6, and C in 7 hours. In what time could they do it working together; and in what time could A and C together do twice as much work?
9. A and B are in partnership. A invests £4700 for 12 months, and receives £446. 10. 0 as his share of the profits. How much should B receive, who invests £2300 for 9 months?
10. Find the cost of 470 shares at  $83\frac{3}{4}$ ,  $\frac{1}{8}$  per cent. on the purchase money being paid for brokerage; and what sum would they produce annually at £3. 10. 6 interest per share?

## PAPER LXXIV.

1. At what rate per cent. per annum Simple Interest will £70 amount to £89. 12. 0 in  $3\frac{1}{2}$  years?
2. Find the value correct to 5 places of decimals of  

$$\sqrt{315} + 3\sqrt{881} + \sqrt{590} + \sqrt{51}.$$
3. Find the difference between Banker's and True discount on £3700 due in 1 year 219 days at 5 per cent. per annum.
4. Find the Commission on £29. 10. 4 at  $14\frac{7}{8}$  per cent.
5. If 9 lbs. of rice cost as much as 4 lbs. of sugar, and 14 lbs. of sugar are worth as much as  $1\frac{1}{2}$  lbs. of tea, and 2 lbs. of tea are worth 5 lbs. of coffee, find the cost of 11 lbs. of coffee if  $2\frac{1}{2}$  lbs. of rice cost 5d.

6. Divide £1. 10. 0 among  $A$ ,  $B$  and  $C$  in the ratio of  $\frac{2}{3}$ ,  $\frac{1}{2}$  and  $\frac{1}{15}$ .
7. Find by the rule of Practice the value of 31.075 acres at £72.315 per acre.
8. By selling goods at 11s. 3d. I gain  $12\frac{1}{2}$  per cent.; at what price should they be sold to lose  $12\frac{1}{2}$  per cent.?
9. What ready money will pay a bill of £49. 17. 6, discount being allowed at the rate of 5 per cent.?
10. A sum of money is placed out at Compound Interest at 5 per cent. per annum, and at the end of two years £338. 10. 0 is added to it. At the expiration of 5 years from the first investment, the whole principal and interest amounted to £1157. 12. 6. Find the sum originally invested.

## PAPER LXXV.

1. The shortest distance from a house to a circular lake is exactly 4 miles; a road proceeding in a straight line from the house past the shore of the lake touches the shore at a point 8 miles from the house. What is the area of the lake?
2. A person having invested £10500 in the  $3\frac{1}{2}$  per cents. at 98 for seven years sells out at the end of that time. He invests both stock and profit in Railway Debentures at 129 $\frac{3}{4}$ , bearing interest at the rate of  $2\frac{3}{4}$  per cent. half-yearly. What is the difference in his annual income?
3. If I buy 308 tons of pig iron at £5. 16. 8 per ton, and sell the whole for £1848, find my whole gain, and what I gain per cent.
4. Find the Compound Interest of £403 for  $2\frac{3}{4}$  years at 3 per cent. quarterly; and compute what Principal would be necessary to produce £23863. 10. 0 interest in a quarter of a century at 5 per cent. Compound Interest.
5. At what time between 5 and 6 o'clock are the hour and minute hands of a watch (i) together, (ii) at right angles, and (iii) intercepting an angle of  $165^\circ$ ?
6. The closing price of the following Railway shares on Thursday, Oct. 23, 1879, was, London and North Western, 4 per cent. stock 109 $\frac{1}{4}$ ; London, Chatham, and Dover,  $4\frac{1}{2}$  per cent. 113 $\frac{1}{4}$ ; Great Western, 4 per cent. 108 $\frac{3}{4}$ ; and Midland, 4 per cent. 108 $\frac{3}{4}$ . What must a person invest in each description of stock so that, receiving altogether a dividend of 1000 guineas annually, the interest derived from his shares in the Companies named may be in the ratio of 5, 4, 3 and 2 respectively?

7. Simplify

$$\frac{\cdot 14285\dot{7} \times \cdot 07692\dot{3}}{\cdot 01098\dot{9}} + \frac{2\cdot 7\dot{5} \times 11\cdot 25}{6\cdot 2}.$$

8. Find the value correct to 6 places of decimals of

$$\sqrt[3]{45} + \sqrt[3]{982} + 5\sqrt{15} + 9\sqrt{380}.$$

9. Official statistics give the population of Chicago in 1830 as 70, in 1840 it was 4853, in 1850 it had increased to 29963, in 1860 it amounted to 112172, and in 1870 to 298977 inhabitants. Give the increase per cent. for each decade, and find the population for 1880 supposing half the rate of increase during the decade ending with 1870 to be maintained.

10. Divide 40 guineas among *A*, *B*, *C* and *D* in such a manner that *A*'s money shall be one-fourth as much again as *B*'s, one-third less than twice as much as *C*'s, and equivalent to *C*'s and *D*'s shares combined.



A TABLE OF THE AMOUNTS OF £1 AT COMPOUND INTEREST  
FROM 1 TO 40 TERMS OF PAYMENT,

*Corrected to five places of decimals.*

Terms.	3 per cent.	4 per cent.	5 per cent.	6 per cent.
1	1·03000	1·04000	1·05000	1·06000
2	1·06090	1·08160	1·10250	1·12360
3	1·09273	1·12486	1·15762	1·19102
4	1·12551	1·16986	1·21551	1·26248
5	1·15927	1·21665	1·27628	1·33823
6	1·19406	1·26532	1·34010	1·41852
7	1·22988	1·31593	1·40710	1·50363
8	1·26678	1·36857	1·47745	1·59385
9	1·30477	1·42331	1·55132	1·68948
10	1·34392	1·48024	1·62889	1·79085
11	1·38423	1·53945	1·71034	1·89830
12	1·42576	1·60103	1·79586	2·01220
13	1·46853	1·66507	1·88565	2·13293
14	1·51259	1·73167	1·97993	2·26091
15	1·55797	1·80094	2·07893	2·39656
16	1·60471	1·87298	2·18287	2·54035
17	1·65285	1·94790	2·29202	2·69277
18	1·70244	2·02582	2·40662	2·85434
19	1·75351	2·10685	2·52695	3·02560
20	1·80612	2·19112	2·65330	3·20714
21	1·86030	2·27877	2·78596	3·39957
22	1·91610	2·36992	2·92526	3·60354
23	1·97358	2·46472	3·07152	3·81975
24	2·03279	2·56331	3·22510	4·04893
25	2·09377	2·66584	3·38635	4·29187
26	2·15658	2·77247	3·55567	4·54938
27	2·22128	2·88337	3·73346	4·82234
28	2·28792	2·99870	3·92013	5·11168
29	2·35656	3·11865	4·11614	5·41838
30	2·42726	3·24340	4·32195	5·74349
31	2·50008	3·37314	4·53805	6·08810
32	2·57508	3·50807	4·76495	6·45339
33	2·65233	3·64839	5·00319	6·84059
34	2·73190	3·79433	5·25335	7·25103
35	2·81386	3·94609	5·51601	7·68609
36	2·89828	4·10393	5·79182	8·14725
37	2·98523	4·26809	6·08141	8·63609
38	3·07479	4·43881	6·38548	9·15425
39	3·16703	4·61637	6·70475	9·70351
40	3·26204	4·80102	7·03999	10·28572

# A TABLE OF THE SPECIFIC GRAVITIES OF COMMON SUBSTANCES.

(Distilled water is reckoned at 1·000. A cubic foot of water weighs  
1000 oz. Avoir.)

## *Metals.*

Brass.....	8·200
Bronze .....	8·758
Copper .....	8·726
Gold .....	19·361
„ standard .....	18·888
Gun-metal .....	8·784
Iron, cast .....	7·250
„ wrought .....	7·548
Lead .....	11·388
Platinum, wire drawn .....	21·250
Quicksilver .....	13·568
Silver .....	10·510
Steel, cast .....	7·919
„ wrought .....	7·840
Tin .....	7·299
Zinc, rolled .....	7·191

## *Dry Woods.*

Alder.....	0·500
Ash .....	0·644
Birch.....	0·627
Box .....	0·591
Cork .....	0·240
Elm.....	0·547
Fir .....	0·555
Logwood .....	0·913 to 0·925

Mahogany .....	1·063
Oak .....	0·678
Pine .....	0·537
Poplar.. .....	0·393
Willow .....	0·487

## *Various Bodies.*

Alcohol .....	0·815
Beer .....	1·030
Brick .....	1·710
Chalk.....	1·793 to 2·475
Coal .....	1 232 to 1·510
Earth, common .....	1·485
„ moist sand .....	2·055
„ gravelly soil .....	2·075
„ clay .....	2·150
Flint .....	2·672
Glass .....	2·642
Granite .....	2·688
Ice .....	0·916
Ivory .....	1·825
Lime .....	1·842
Olive-oil .....	0·915
Portland Stone .....	2·496
Rock Salt .....	2·250
Sea Water.....	1·026 to 1·033
Sulphur .....	1·989

## ANSWERS TO THE EXAMPLES.

# VULGAR FRACTIONS.

## EX. I.

- |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| (1) $\frac{3}{2}$ .      | (2) $\frac{15}{3}$ .     | (3) $\frac{35}{5}$ .     | (4) $\frac{48}{18}$ .    | (5) $\frac{98}{7}$ .     |
| (6) $\frac{153}{9}$ .    | (7) $\frac{195}{15}$ .   | (8) $\frac{92}{4}$ .     | (9) $\frac{72}{8}$ .     | (10) $\frac{45}{3}$ .    |
| (11) $\frac{260}{10}$ .  | (12) $\frac{1053}{9}$ .  | (13) $\frac{206}{7}$ .   | (14) $\frac{561}{11}$ .  | (15) $\frac{1314}{18}$ . |
| (16) $\frac{6418}{63}$ . | (17) $\frac{6816}{71}$ . | (18) $\frac{2025}{25}$ . | (19) $\frac{1704}{24}$ . | (20) $\frac{1102}{19}$ . |

## EX. II.

- |                              |                             |                              |                             |                          |
|------------------------------|-----------------------------|------------------------------|-----------------------------|--------------------------|
| (1) $\frac{3}{2}$ .          | (2) $\frac{7}{4}$ .         | (3) $\frac{5}{2}$ .          | (4) $\frac{29}{4}$ .        | (5) $\frac{35}{4}$ .     |
| (6) $\frac{46}{5}$ .         | (7) $\frac{24}{7}$ .        | (8) $\frac{49}{5}$ .         | (9) $\frac{101}{9}$ .       | (10) $\frac{43}{8}$ .    |
| (11) $\frac{82}{3}$ .        | (12) $\frac{226}{15}$ .     | (13) $\frac{847}{8}$ .       | (14) $\frac{167}{13}$ .     | (15) $\frac{1253}{10}$ . |
| (16) $\frac{11720}{13}$ .    | (17) $\frac{977}{6}$ .      | (18) $\frac{1190}{13}$ .     | (19) $\frac{1158}{17}$ .    | (20) $\frac{159}{10}$ .  |
| (21) $\frac{439}{6}$ .       | (22) $\frac{2127}{23}$ .    | (23) $\frac{116}{7}$ .       | (24) $\frac{159}{10}$ .     |                          |
| (25) $\frac{220}{19}$ .      | (26) $\frac{2554}{15}$ .    | (27) $\frac{2027}{21}$ .     | (28) $\frac{651248}{807}$ . |                          |
| (29) $\frac{13562}{71}$ .    | (30) $\frac{1559}{40}$ .    | (31) $\frac{10505}{102}$ .   |                             |                          |
| (32) $\frac{13189}{137}$ .   | (33) $\frac{1955}{38}$ .    | (34) $\frac{7020}{11}$ .     |                             |                          |
| (35) $\frac{98266}{109}$ .   | (36) $\frac{193973}{440}$ . | (37) $\frac{5539}{40}$ .     |                             |                          |
| (38) $\frac{1972}{28}$ .     | (39) $\frac{1551}{16}$ .    | (40) $\frac{754677}{1076}$ . |                             |                          |
| (41) $\frac{29254}{212}$ .   | (42) $\frac{41999}{60}$ .   | (43) $\frac{1700}{125}$ .    |                             |                          |
| (44) $\frac{15450}{133}$ .   | (45) $\frac{14447}{182}$ .  | (46) $\frac{50921}{117}$ .   |                             |                          |
| (47) $\frac{990264}{110}$ .  | (48) $\frac{6559}{89}$ .    | (49) $\frac{3351}{17}$ .     |                             |                          |
| (50) $\frac{1544604}{512}$ . |                             |                              |                             |                          |

## EX. III.

- |  |  |  |  |
|--|--|--|--|
| (1) 4; 10.                                   | (2) $6\frac{1}{3}$ ; $6\frac{2}{3}$ .      | (3) $2\frac{2}{7}$ ; $16\frac{3}{5}$ .     | (4) $3\frac{1}{5}$ ; 15.                   |
| (5) $5\frac{1}{2}$ ; $11\frac{4}{7}$ .       | (6) $2\frac{1}{7}$ ; $4\frac{2}{3}$ .      | (7) $3\frac{2}{5}$ ; $4\frac{3}{7}$ .      | (8) 3; 30.                                 |
| (9) $12\frac{5}{9}$ ; $8\frac{1}{2}$ .       | (10) $15\frac{8}{9}$ ; $6\frac{1}{9}$ .    | (11) $9\frac{9}{15}$ ; $7\frac{11}{10}$ .  | (12) $64\frac{6}{11}$ ; $13\frac{4}{13}$ . |
| (13) $3\frac{9}{10}$ ; $7\frac{4}{12}$ .     | (14) $55\frac{5}{13}$ ; $60\frac{1}{18}$ . | (15) $9\frac{3}{8}$ ; 303.                 | (16) $70\frac{6}{17}$ ; $60\frac{2}{15}$ . |
| (17) $14\frac{36}{39}$ ; $64\frac{15}{17}$ . | (18) $5\frac{9}{13}$ ; $21\frac{8}{13}$ .  | (19) $20\frac{3}{14}$ ; $24\frac{1}{21}$ . |  |
| (20) $61\frac{9}{17}$ ; $82\frac{5}{7}$ .    | (21) $53\frac{23}{63}$ ; $7\frac{9}{10}$ . | (22) $41\frac{9}{10}$ ; $38\frac{9}{19}$ . |  |
| (23) 191; $16\frac{7}{9}$ .                  | (24) $65\frac{1}{17}$ ; $16\frac{5}{31}$ . | (25) $3\frac{8}{19}$ ; $77\frac{1}{11}$ .  |  |

- (26)  $7; 8\frac{1}{3}$ . (27)  $8\frac{1}{11}; 15\frac{5}{8}$ . (28)  $27; 10\frac{1}{2}$ .  
 (29)  $20\frac{3}{8}; 7\frac{1}{3}$ . (30)  $57\frac{2}{3}; 203\frac{1}{5}$ . (31)  $34\frac{1}{11}; 11$ .  
 (32)  $88\frac{2}{5}; 13\frac{1}{6}$ . (33)  $2\frac{1}{3}; 7\frac{1}{6}$ . (34)  $69\frac{2}{3}; 14\frac{2}{3}$ .  
 (35)  $200\frac{1}{2}; 51\frac{1}{3}$ . (36)  $83\frac{7}{8}; 25\frac{5}{8}$ . (37)  $507\frac{1}{6}; 461\frac{1}{3}$ .  
 (38)  $53\frac{1}{8}; 48\frac{1}{6}$ . (39)  $12\frac{3}{8}; 14\frac{1}{3}$ . (40)  $27\frac{5}{6}; 61\frac{1}{3}$ .  
 (41)  $108\frac{2}{3}; 236\frac{1}{7}$ . (42)  $70\frac{8}{10}; 80\frac{1}{3}$ . (43)  $102\frac{3}{6}; 227\frac{1}{3}$ .  
 (44)  $195\frac{1}{3}; 247\frac{1}{7}$ . (45)  $643; 234\frac{2}{3}$ . (46)  $1924\frac{1}{3}; 1163\frac{1}{3}$ .  
 (47)  $16\frac{1}{8}; 20\frac{1}{5}$ . (48)  $30\frac{1}{10}; 9\frac{1}{2}$ . (49)  $88\frac{1}{6}; 11\frac{1}{3}$ .  
 (50)  $12\frac{1}{4}; 11\frac{1}{6}$ .

## Ex. IV.

- (1)  $\frac{2}{7}; \frac{3}{4}$ . (2)  $\frac{1}{20}; \frac{1}{4}$ . (3)  $\frac{2}{7}; \frac{1}{6}$ . (4)  $\frac{8}{5}; \frac{1}{6}$ .  
 (5)  $\frac{1}{30}; \frac{2}{5}$ . (6)  $\frac{1}{7}; \frac{1}{15}$ . (7)  $\frac{1}{27}; \frac{1}{6}$ . (8)  $\frac{6}{7}; \frac{1}{3}$ .  
 (9)  $\frac{1}{8}; \frac{5}{10}$ . (10)  $\frac{1}{10}; \frac{1}{10}$ . (11)  $\frac{1}{12}; \frac{1}{11}$ . (12)  $\frac{5}{8}; \frac{1}{10}$ .  
 (13)  $\frac{2}{3}; \frac{1}{10}$ . (14)  $\frac{7}{6}; \frac{1}{6}$ . (15)  $\frac{2}{7}; \frac{1}{37}$ . (16)  $\frac{4}{5}; \frac{1}{10}$ .  
 (17)  $\frac{8}{13}; \frac{1}{10}$ . (18)  $\frac{1}{23}; \frac{2}{5}$ . (19)  $\frac{1}{17}; \frac{1}{10}$ . (20)  $\frac{2}{3}; \frac{5}{6}$ .  
 (21)  $\frac{7}{13}; \frac{1}{6}$ . (22)  $\frac{1}{10}; \frac{1}{10}$ . (23)  $\frac{1}{14}; \frac{1}{18}$ . (24)  $\frac{2}{7}; \frac{1}{3}$ .  
 (25)  $\frac{1}{10}; \frac{1}{10}$ . (26)  $\frac{1}{6}; \frac{1}{11}$ . (27)  $\frac{1}{10}; \frac{1}{10}$ . (28)  $\frac{2}{3}; \frac{1}{10}$ .  
 (29)  $\frac{1}{43}; \frac{1}{37}$ . (30)  $\frac{1}{10}; \frac{1}{10}$ . (31)  $\frac{2}{3}; \frac{1}{37}$ . (32)  $\frac{2}{3}; \frac{1}{3}$ .  
 (33)  $\frac{7}{6}; \frac{1}{3}$ . (34)  $\frac{1}{6}; \frac{1}{3}$ . (35)  $\frac{1}{10}; \frac{1}{10}$ . (36)  $\frac{1}{7}; \frac{1}{10}$ .  
 (37)  $\frac{2}{3}; \frac{1}{7}$ . (38)  $\frac{3}{10}; \frac{1}{10}$ . (39)  $\frac{1}{10}; \frac{1}{10}$ . (40)  $\frac{5}{6}; \frac{1}{12}$ .  
 (41)  $\frac{1}{14}; \frac{1}{17}$ . (42)  $\frac{5}{8}; \frac{1}{4}$ . (43)  $\frac{1}{11}; \frac{1}{10}$ . (44)  $\frac{1}{10}; \frac{1}{10}$ .  
 (45)  $\frac{3}{10}; \frac{1}{10}$ . (46)  $\frac{1}{11}; \frac{1}{10}$ . (47)  $\frac{1}{11}; \frac{1}{10}$ . (48)  $\frac{1}{11}; \frac{1}{10}$ .  
 (49)  $\frac{1}{11}; \frac{1}{10}$ . (50)  $\frac{1}{11}; \frac{1}{10}$ .

## Ex. V.

- (1)  $\frac{6, 4, 3}{12}$ . (2)  $\frac{6, 3, 2}{18}$ . (3)  $\frac{16, 18, 15}{24}$ .  
 (4)  $\frac{20, 15, 16}{100}$ . (5)  $\frac{12, 6, 3}{28}$ .  
 (6)  $\frac{6, 4, 24, 21}{66}$ . (7)  $\frac{6, 8, 9, 5}{12}$ .  
 (8)  $\frac{30, 16, 14, 33}{36}$ . (9)  $\frac{110, 33, 135, 66}{165}$ .  
 (10)  $\frac{6, 9, 20, 14}{24}$ . (11)  $\frac{78, 52, 45, 61}{117}$ .  
 (12)  $\frac{72, 50, 63, 6}{90}$ . (13)  $\frac{45, 110, 112, 63}{120}$ .  
 (14)  $\frac{378, 385, 300, 350}{420}$ . (15)  $\frac{660, 385, 891, 1080}{1485}$ .  
 (16)  $\frac{22, 25, 20, 27}{30}$ . (17)  $\frac{2240, 904, 2147, 678}{2260}$ .

- (18)  $\frac{48, 49, 20, 22}{56}$ .  
 (20)  $\frac{54, 108, 81, 40}{144}$ .  
 (22)  $\frac{600, 560, 525, 400}{1680}$ .  
 (24)  $\frac{1040, 936, 585, 540}{1440}$ .  
 (26)  $\frac{24, 30, 37, 221}{222}$ .  
 (28)  $\frac{675, 680, 468, 660}{720}$ .  
 (30)  $\frac{216, 66, 104, 183}{240}$ .  
 (32)  $\frac{400, 630, 93, 690}{720}$ .  
 (34)  $\frac{882, 1155, 360, 900}{1260}$ .  
 (36)  $\frac{171, 126, 131, 140, 60}{180}$ .  
 (38)  $\frac{218025, 218880, 219640, 220320, 220932}{232560}$ .  
 (39)  $\frac{32, 14, 27, 30, 39}{48}$ .  
 (41)  $\frac{504, 510, 434, 168, 476}{714}$ .  
 (42)  $\frac{108, 555, 481, 630, 886}{999}$ .  
 (43)  $\frac{58905, 55410, 52360, 47124, 44880}{171360}$ .  
 (44)  $\frac{992, 276, 220, 899}{1240}$ .  
 (46)  $\frac{205, 110, 480, 78}{510}$ .  
 (48)  $\frac{7425, 3000, 4675, 9570, 2244}{36300}$ .  
 (49)  $\frac{57, 32, 84, 80, 72}{96}$ .  
 (50)  $\frac{2079, 1925, 2205, 2970, 1320, 1155}{3465}$ .
- (19)  $\frac{12, 45, 28, 21}{63}$ .  
 (21)  $\frac{585, 520, 468, 390}{720}$ .  
 (23)  $\frac{44, 25, 70, 110}{385}$ .  
 (25)  $\frac{105, 28, 432, 468}{504}$ .  
 (27)  $\frac{150, 175, 96, 55}{200}$ .  
 (29)  $\frac{12, 21, 20, 14}{24}$ .  
 (31)  $\frac{34, 108, 92, 39}{138}$ .  
 (33)  $\frac{108, 132, 84, 102}{180}$ .  
 (35)  $\frac{30, 40, 45, 48, 50}{60}$ .  
 (37)  $\frac{3520, 1782, 1620, 1815, 3600}{3960}$ .  
 (40)  $\frac{1008, 651, 819, 728, 708}{1092}$ .  
 (45)  $\frac{18, 72, 93, 116}{204}$ .  
 (47)  $\frac{2100, 2160, 2205, 2240, 2268, 2310}{2520}$ .

## Ex. VI.

(1) $\frac{1}{8}$ .	(2) $\frac{3}{8}$ .	(3) $\frac{4}{8}$ .	(4) $\frac{1}{4}$ .
(5) $\frac{1}{12}$ .	(6) $\frac{1}{10}$ .	(7) $\frac{1}{7}$ .	(8) $\frac{1}{5}$ .
(9) $\frac{6}{40}$ .	(10) $\frac{6}{31}$ .	(11) 2.	(12) $3\frac{1}{2}$ .
(13) $1\frac{0}{8}$ .	(14) $6\frac{3}{4}$ .	(15) $27\frac{3}{8}$ .	(16) $2295\frac{1}{2}$ .
(17) $3\frac{7}{10}$ .	(18) $\frac{1}{8}$ .	(19) $1\frac{1}{4}$ .	(20) $74\frac{9}{4}$ .
(21) $316\frac{3}{3}$ .	(22) 2.	(23) 5.	(24) $4\frac{9}{1}$ .
(25) $4\frac{7}{18}$ .	(26) $7\frac{1}{10}$ .	(27) $\frac{1}{4}$ .	(28) $\frac{1}{5}$ .
(29) $4\frac{2}{7}$ .	(30) $2\frac{7}{2}$ .	(31) $\frac{1}{3}$ .	(32) $\frac{1}{3}$ .
(33) $1244\frac{1}{2}$ .	(34) 12.	(35) $5\frac{5}{2}$ .	(36) $5\frac{1}{4}$ .
(37) $4\frac{1}{2}$ .	(38) $4\frac{1}{2}$ .	(39) $\frac{1}{1}$ .	(40) 9.
(41) $2\frac{1}{4}$ .	(42) $\frac{1}{4}$ .	(43) $3\frac{1}{1}$ .	(44) $4\frac{1}{2}$ .
(45) $\frac{1}{4}$ .	(46) $7\frac{1}{4}$ .	(47) $2438\frac{1}{3}$ .	(48) $28\frac{1}{3}$ .
(49) $1\frac{2}{27}$ .	(50) $\frac{5}{6}$ .		

## Ex. VII.

(1) $1\frac{1}{2}$ .	(2) $\frac{2}{5}$ .	(3) $\frac{5}{1}$ .	(4) $\frac{7}{8}$ .
(5) $\frac{3}{8}$ .	(6) 1.	(7) $1\frac{1}{2}$ .	(8) $2\frac{3}{4}$ .
(9) $2\frac{2}{3}$ .	(10) $1\frac{4}{5}$ .	(11) $1\frac{1}{4}$ .	(12) $\frac{2}{3}$ .
(13) 2.	(14) $2\frac{3}{5}$ .	(15) $1\frac{3}{8}$ .	(16) $1\frac{3}{8}$ .
(17) $2\frac{3}{1}$ .	(18) $2\frac{9}{10}$ .	(19) $2\frac{0}{10}$ .	(20) $1\frac{0}{10}$ .
(21) $2\frac{6}{7}$ .	(22) $1\frac{2}{4}$ .	(23) $1\frac{1}{2}$ .	(24) $3\frac{4}{5}$ .
(25) $2\frac{6}{3}$ .	(26) $1\frac{7}{8}$ .	(27) $3\frac{2}{10}$ .	(28) $3\frac{2}{10}$ .
(29) $3\frac{1}{10}$ .	(30) $1\frac{1}{10}$ .	(31) $8\frac{3}{1}$ .	(32) $16\frac{4}{1}$ .
(33) $19\frac{8}{5}$ .	(34) $10\frac{4}{5}$ .	(35) $20\frac{1}{1}$ .	(36) $39\frac{3}{1}$ .
(37) $42\frac{8}{8}$ .	(38) $23\frac{2}{5}$ .	(39) $30\frac{3}{8}$ .	(40) $28\frac{5}{8}$ .
(41) $19\frac{9}{10}$ .	(42) $10\frac{9}{10}$ .	(43) $1\frac{3}{4}$ .	(44) $6\frac{7}{10}$ .
(45) $14\frac{1}{4}$ .	(46) 27.	(47) $3\frac{1}{8}$ .	(48) $13\frac{5}{8}$ .
(49) $29\frac{5}{3}$ .	(50) 13.		

## Ex. VIII.

(1) $\frac{1}{5}$ .	(2) $\frac{2}{5}$ .	(3) $1\frac{1}{2}$ .	(4) $1\frac{1}{2}$ .
(5) $\frac{3}{5}$ .	(6) $1\frac{1}{5}$ .	(7) $\frac{3}{2}$ .	(8) $\frac{2}{3}$ .
(9) $\frac{2}{5}$ .	(10) $\frac{1}{3}$ .	(11) $\frac{1}{5}$ .	(12) $7\frac{2}{3}$ .
(13) $1\frac{2}{3}$ .	(14) $\frac{1}{3}$ .	(15) $\frac{1}{8}$ .	(16) $12\frac{2}{5}$ .
(17) $5\frac{7}{8}$ .	(18) $\frac{5}{9}$ .	(19) $\frac{5}{9}$ .	(20) $2\frac{2}{3}$ .
(21) $101\frac{3}{10}$ .	(22) $5\frac{3}{10}$ .	(23) $2\frac{6}{10}$ .	(24) $11\frac{3}{4}$ .
(25) $\frac{2}{10}$ .	(26) $\frac{2}{10}$ .	(27) $\frac{1}{10}$ .	(28) $\frac{1}{10}$ .
(29) $1\frac{3}{10}$ .	(30) $2\frac{4}{10}$ .	(31) $1\frac{9}{10}$ .	(32) $\frac{2}{3}$ .
(33) 0.	(34) $\frac{5}{8}$ .	(35) $\frac{3}{7}$ .	(36) $2\frac{4}{3}$ .
(37) $\frac{1}{20}$ .	(38) $1\frac{3}{2}$ .	(39) $\frac{2}{5}$ .	(40) $\frac{4}{5}$ .

- |                           |                           |                          |                         |
|---------------------------|---------------------------|--------------------------|-------------------------|
| (41) $\frac{25}{48}$ .    | (42) $5\frac{3}{8}$ .     | (43) $1\frac{61}{112}$ . | (44) $\frac{59}{105}$ . |
| (45) $1\frac{421}{440}$ . | (46) $3\frac{2}{5}$ .     | (47) $5\frac{1}{2}$ .    | (48) $2\frac{5}{28}$ .  |
| (49) $\frac{93}{128}$ .   | (50) $1\frac{339}{448}$ . |                          |                         |

## Ex. IX.

- |                         |                        |                        |                         |
|-------------------------|------------------------|------------------------|-------------------------|
| (1) $\frac{2}{3}$ .     | (2) $2\frac{1}{2}$ .   | (3) $\frac{4}{5}$ .    | (4) $\frac{1}{4}$ .     |
| (5) $\frac{7}{10}$ .    | (6) $\frac{5}{8}$ .    | (7) $\frac{49}{162}$ . | (8) $\frac{1}{2}$ .     |
| (9) $\frac{6}{7}$ .     | (10) $19\frac{7}{2}$ . | (11) 33.               | (12) $\frac{1}{5}$ .    |
| (13) $\frac{8}{9}$ .    | (14) $2\frac{1}{2}$ .  | (15) 21.               | (16) $\frac{27}{100}$ . |
| (17) $\frac{5}{21}$ .   | (18) $2\frac{1}{2}$ .  | (19) 12.               | (20) $\frac{5}{8}$ .    |
| (21) $1\frac{1}{2}$ .   | (22) $2\frac{5}{18}$ . | (23) 1200.             | (24) 14.                |
| (25) $6\frac{2}{40}$ .  | (26) $\frac{1}{8}$ .   | (27) $5\frac{5}{8}$ .  | (28) $\frac{9}{25}$ .   |
| (29) 40.                | (30) $1\frac{3}{4}$ .  | (31) $1\frac{1}{6}$ .  | (32) $1\frac{1}{21}$ .  |
| (33) $6\frac{3}{10}$ .  | (34) $34\frac{1}{2}$ . | (35) $\frac{1}{8}$ .   | (36) $3\frac{1}{3}$ .   |
| (37) $1\frac{61}{60}$ . | (38) $1\frac{1}{10}$ . | (39) $26\frac{1}{2}$ . | (40) $\frac{1}{60}$ .   |
| (41) 13.                | (42) $\frac{5}{8}$ .   | (43) $15\frac{1}{2}$ . | (44) $4\frac{9}{10}$ .  |
| (45) $5\frac{3}{10}$ .  | (46) 72.               | (47) $3\frac{9}{16}$ . | (48) $4\frac{2}{3}$ .   |
| (49) $5\frac{1}{10}$ .  | (50) $93\frac{5}{8}$ . |                        |                         |

## Ex. X.

- |                         |                         |                         |                         |
|-------------------------|-------------------------|-------------------------|-------------------------|
| (1) $2\frac{1}{4}$ .    | (2) $2\frac{1}{4}$ .    | (3) $\frac{5}{6}$ .     | (4) $\frac{8}{15}$ .    |
| (5) $1\frac{1}{4}$ .    | (6) $1\frac{1}{10}$ .   | (7) $\frac{1}{8}$ .     | (8) $1\frac{1}{2}$ .    |
| (9) $\frac{7}{8}$ .     | (10) $\frac{4}{5}$ .    | (11) $\frac{2}{3}$ .    | (12) $\frac{4}{5}$ .    |
| (13) $193\frac{1}{3}$ . | (14) $33\frac{2}{3}$ .  | (15) $1\frac{3}{20}$ .  | (16) $1\frac{1}{5}$ .   |
| (17) 14.                | (18) $30\frac{1}{5}$ .  | (19) $\frac{1}{6}$ .    | (20) $\frac{1}{7}$ .    |
| (21) $\frac{2}{3}$ .    | (22) $5\frac{7}{8}$ .   | (23) $\frac{4}{5}$ .    | (24) $\frac{6}{105}$ .  |
| (25) $\frac{2}{378}$ .  | (26) $1\frac{1}{10}$ .  | (27) $\frac{3}{40}$ .   | (28) $2\frac{1}{10}$ .  |
| (29) $273\frac{1}{3}$ . | (30) $1\frac{3}{5}$ .   | (31) $6\frac{2}{7}$ .   | (32) $3\frac{5}{20}$ .  |
| (33) $21\frac{3}{10}$ . | (34) $1\frac{9}{10}$ .  | (35) $33\frac{9}{35}$ . | (36) $30\frac{1}{14}$ . |
| (37) 18.                | (38) $\frac{1}{6}$ .    | (39) $13\frac{1}{2}$ .  | (40) $1\frac{1}{2}$ .   |
| (41) $\frac{1}{537}$ .  | (42) $1\frac{2}{7}$ .   | (43) $46\frac{2}{21}$ . | (44) $\frac{1}{5}$ .    |
| (45) $1\frac{5}{25}$ .  | (46) $20\frac{3}{10}$ . | (47) $\frac{7}{32}$ .   | (48) $\frac{7}{8}$ .    |
| (49) $14\frac{7}{14}$ . | (50) $11\frac{1}{2}$ .  |                         |                         |

## Ex. XI.

- |                        |                        |                          |                         |
|------------------------|------------------------|--------------------------|-------------------------|
| (1) $2\frac{1}{3}$ .   | (2) $1\frac{4}{3}$ .   | (3) $4\frac{9}{28}$ .    | (4) $6\frac{2}{105}$ .  |
| (5) $1\frac{5}{2}$ .   | (6) $\frac{3}{2}$ .    | (7) $\frac{3}{2}$ .      | (8) $10\frac{7}{8}$ .   |
| (9) $1\frac{1}{6}$ .   | (10) $11\frac{1}{2}$ . | (11) $2787\frac{5}{9}$ . | (12) $1\frac{1}{5}$ .   |
| (13) $14\frac{3}{4}$ . | (14) 0.                | (15) $8\frac{1}{2}$ .    | (16) $39\frac{9}{10}$ . |
| (17) $\frac{2}{3}$ .   | (18) $4\frac{2}{3}$ .  | (19) $7\frac{3}{10}$ .   | (20) $34\frac{1}{4}$ .  |
| (21) 0.                | (22) $2\frac{3}{5}$ .  | (23) $2\frac{1}{2}$ .    | (24) $2\frac{3}{8}$ .   |



## Ex. XII.

- |  |   |                                  |
|--|---|----------------------------------|
| (1) £22. 17. $10\frac{1}{2}$ .                   | (2) £16. 11. $11\frac{1}{4}$ .                          | (3) £20. 0. $7\frac{1}{2}$ .     |
| (4) £28. 15. $4\frac{3}{8}$ .                    | (5) £32. 11. $4\frac{5}{8}$ .                           | (6) £25. 7. $8\frac{5}{8}$ .     |
| (7) £25. 0. $11\frac{5}{8}$ .                    | (8) £22. 16. $6\frac{3}{4}$ .                           | (9) £28. 11. $1\frac{7}{8}$ .    |
| (10) £15. 15. $5\frac{1}{2}$ .                   | (11) 14s. $2\frac{3}{4}$ d.                             | (12) 9s. $7\frac{3}{4}$ d.       |
| (13) 1s. $7\frac{1}{2}$ d.                       | (14) £6. 8. $8\frac{5}{8}$ .                            | (15) £3. 9. $11\frac{1}{3}$ .    |
| (16) £3. 0. $8\frac{7}{8}$ .                     | (17) £71. 16. $6\frac{1}{2}$ .                          | (18) £56. 1. $3\frac{3}{5}$ .    |
| (19) £1. 0. $10\frac{7}{8}$ .                    | (20) £33. 16. $9\frac{1}{10}\frac{5}{10}\frac{5}{10}$ . | (21) £55. 8. 2.                  |
| (22) £118. 10. 0.                                | (23) £110. 16. $9\frac{3}{4}$ .                         | (24) £1. 16. 2.                  |
| (25) £8. 6. $0\frac{9}{8}$ .                     | (26) £2. 12. $4\frac{1}{4}$ .                           | (27) £53. 1. $0\frac{1}{2}$ .    |
| (28) £41. 12. $10\frac{3}{8}$ .                  | (29) £63. 18. $5\frac{3}{4}$ .                          | (30) £81. 17. $5\frac{7}{8}$ .   |
| (31) 19 cwt. 1 qr. 6 lbs.                        | (32) 45 tons 10 cwt. $1\frac{1}{2}$ lbs.                |                                  |
| (33) 68 ac. 2 r. $27\frac{3}{8}$ p.              | (34) 92 lbs. 4 oz. 1 dwt. $11\frac{1}{8}$ grs.          |                                  |
| (35) 89 qrs. 3 bus. $1\frac{3}{8}$ pks.          | (36) 111 dys. 5 h. $51\frac{1}{4}$ m.                   |                                  |
| (37) 10 m. 1 f. $75\frac{2}{3}$ yds.             | (38) 107 yds. 1 ft. $3\frac{3}{4}$ in.                  |                                  |
| (39) 982 yds. 1 n. $0\frac{1}{2}$ in.            | (40) 42 c. yds. 3 ft. $111\frac{1}{8}$ in.              |                                  |
| (41) £4. 12. $7\frac{1}{2}$ .                    | (42) 17s. $4\frac{3}{8}$ d.                             | (43) £3. 17. $9\frac{1}{2}$ .    |
| (44) £12. 13. $4\frac{1}{2}$ .                   | (45) £9. 0. 9.  | (46) £3. 3. $9\frac{1}{8}$ .     |
| (47) £1. 9. $4\frac{3}{8}$ .                     | (48) £297. 2. $6\frac{1}{4}$ .                          | (49) £501. 19. $10\frac{1}{4}$ . |
| (50) £24. 9. $4\frac{5}{8}$ .                    | (51) 3 ac. 2 r. $32\frac{1}{2}$ p.                      |                                  |
| (52) 1 lb. 7 oz. $14\frac{1}{8}$ drs.            | (53) 3 qrs. 7 bus. $0\frac{1}{2}$ pks.                  |                                  |
| (54) 11 yrs. 136 dys. $8\frac{1}{4}$ hrs.        | (55) 15 m. 5 f. 34 p. $4\frac{1}{16}$ yds.              |                                  |
| (56) 7 sq. ft. $63\frac{3}{8}$ in.               | (57) 371 yds. 1 ft. $6\frac{1}{4}$ in.                  |                                  |
| (58) 8 cwt. $10\frac{3}{4}$ lbs.                 | (59) 2 cwt. 2 qrs. 8 lbs.                               |                                  |
| (60) 140 lbs. 7 oz. 1 dr. $6\frac{3}{8}$ grs.    | (61) £1. 16. $3\frac{1}{2}$ .                           |                                  |
| (62) 9s. 4d.                                     | (63) 2s. $11\frac{1}{4}$ d.                             | (64) $10\frac{1}{2}$ d.          |
| (65) 1s. $3\frac{1}{2}$ d.                       | (66) £5. 4. $11\frac{1}{2}$ .                           | (67) 1s. $1\frac{1}{2}$ d.       |
| (68) £6. 18. $10\frac{3}{8}$ .                   | (69) £5. 1. $2\frac{1}{2}$ .                            | (70) 4s. $3\frac{1}{2}$ d.       |
| (71) 7s. $0\frac{1}{2}$ d.                       | (72) 4s. $5\frac{1}{4}$ d.                              | (73) 14s. 7d.                    |
| (74) 6s. $4\frac{1}{2}$ d.                       | (75) 2s. $1\frac{7}{8}$ d.                              | (76) 3 cwt. 1 qr. 4 lbs.         |
| (77) 1 cwt. $1\frac{5}{8}$ lbs.                  | (78) 1 lb. 5 oz. $4\frac{1}{2}$ drs.                    |                                  |
| (79) 4 cwt. 2 qrs. $8\frac{3}{8}$ lbs.           | (80) 12 lbs. 2 oz.                                      |                                  |
| (81) 7 lbs. 4 oz.                                | (82) 1 ton 11 cwt. 3 qrs. 13 lbs.                       |                                  |
| (83) 15 cwt. 2 qrs. $26\frac{2}{3}$ lbs.         | (84) 1 ton 7 cwt. 7 lbs.                                |                                  |
| (85) 7 c. ft. 643 in.                            | (86) 16 cwt. 3 lbs. 4 oz.                               |                                  |
| (87) 2 m. 6 f. $97\frac{1}{2}$ yds.              | (88) 6 fur. 4 p. $31\frac{1}{2}$ yds.                   |                                  |
| (89) 3 hrs. $16\frac{1}{4}$ min.                 | (90) 1 dy. 19 hrs. $30\frac{3}{4}$ m.                   |                                  |
| (91) 1 ac. 1 r. 26 p. 28 yds. $0\frac{7}{8}$ ft. | (92) 1 ft. $1\frac{2}{3}$ in.                           |                                  |
| (93) 3 pks. 1 gal. 1 qt. $1\frac{1}{2}$ pts.     | (94) 1 qr. 2 bus. $0\frac{1}{2}$ pks.                   |                                  |
| (95) 2 fur. $4\frac{1}{10}$ yds.                 | (96) 1 hr. $21\frac{2}{3}$ min.                         |                                  |

(97) 14 cwt. 1 qr. 4 lbs.

(98) 18 cwt. 1 qr.  $10\frac{1}{2}$  lbs.(99) 6 m. 7 fur.  $82\frac{1}{2}$  yds.(100) 1 cwt. 2 qrs.  $15\frac{2}{3}$  lbs.

## Ex. XIII.

- |                            |                           |                           |                            |
|----------------------------|---------------------------|---------------------------|----------------------------|
| (1) $\frac{1}{8}$ .        | (2) $\frac{1}{15}$ .      | (3) $\frac{3}{8}$ .       | (4) $\frac{11}{30}$ .      |
| (5) $\frac{59}{300}$ .     | (6) $\frac{1}{10}$ .      | (7) $\frac{51}{300}$ .    | (8) $\frac{17}{80}$ .      |
| (9) $1\frac{7}{8}$ .       | (10) $\frac{1}{8}$ .      | (11) $\frac{7}{10}$ .     | (12) $3\frac{7}{80}$ .     |
| (13) $\frac{173}{300}$ .   | (14) $\frac{1}{30}$ .     | (15) $\frac{1}{5}$ .      | (16) $\frac{33}{80}$ .     |
| (17) $\frac{3}{10}$ .      | (18) $\frac{1}{10}$ .     | (19) $\frac{21}{100}$ .   | (20) $1\frac{13}{80}$ .    |
| (21) $\frac{91}{300}$ .    | (22) $\frac{1}{10}$ .     | (23) $\frac{1}{10}$ .     | (24) $\frac{47}{80}$ .     |
| (25) $\frac{1001}{2000}$ . | (26) $1\frac{39}{400}$ .  | (27) $4\frac{13}{300}$ .  | (28) $\frac{425}{2000}$ .  |
| (29) $\frac{569}{400}$ .   | (30) $1\frac{39}{400}$ .  | (31) $1\frac{79}{1100}$ . | (32) $\frac{25}{80}$ .     |
| (33) $1\frac{25}{64}$ .    | (34) $\frac{69}{100}$ .   | (35) $\frac{89}{800}$ .   | (36) $4\frac{9}{1000}$ .   |
| (37) $1\frac{6}{110}$ .    | (38) $1\frac{2}{43}$ .    | (39) $4\frac{17}{24}$ .   | (40) $\frac{19}{80}$ .     |
| (41) $\frac{113}{240}$ .   | (42) $\frac{1}{10}$ .     | (43) $\frac{1}{3}$ .      | (44) $\frac{13}{80}$ .     |
| (45) $1\frac{5}{16}$ .     | (46) $\frac{1}{8}$ .      | (47) $1\frac{3}{60}$ .    | (48) $\frac{5}{8}$ .       |
| (49) $\frac{9}{10}$ .      | (50) $\frac{1}{3}$ .      | (51) $\frac{1}{2}$ .      | (52) $\frac{5}{72}$ .      |
| (53) $4\frac{1}{8}$ .      | (54) $\frac{53}{80}$ .    | (55) $\frac{37}{32}$ .    | (56) $\frac{113}{2000}$ .  |
| (57) $1\frac{7}{84}$ .     | (58) $\frac{1}{8}$ .      | (59) $\frac{1}{4}$ .      | (60) $\frac{5}{64}$ .      |
| (61) $\frac{753}{4000}$ .  | (62) $\frac{11}{330}$ .   | (63) $1\frac{23}{3}$ .    | (64) $1\frac{35}{16}$ .    |
| (65) $\frac{27}{10}$ .     | (66) $\frac{205}{1000}$ . | (67) $\frac{21}{240}$ .   | (68) $\frac{111}{2000}$ .  |
| (69) $3\frac{97}{1000}$ .  | (70) $\frac{7}{100}$ .    | (71) $\frac{9}{100}$ .    | (72) $1\frac{32}{3000}$ .  |
| (73) $\frac{3}{8}$ .       | (74) $\frac{1}{2}$ .      | (75) $\frac{1}{12}$ .     | (76) $\frac{156}{32000}$ . |
| (77) $1\frac{13}{8}$ .     | (78) $\frac{1}{4}$ .      | (79) $\frac{1}{12}$ .     | (80) $\frac{14}{33}$ .     |

## Ex. XIV.

- |                           |                           |                          |                              |
|---------------------------|---------------------------|--------------------------|------------------------------|
| (1) $\frac{2}{5}$ .       | (2) $\frac{3}{8}$ .       | (3) $\frac{3}{8}$ .      | (4) $1\frac{147}{75}$ .      |
| (5) $\frac{21}{300}$ .    | (6) $\frac{7}{100}$ .     | (7) $\frac{7}{100}$ .    | (8) $1\frac{7}{3}$ .         |
| (9) $\frac{11}{21}$ .     | (10) $\frac{23}{300}$ .   | (11) $\frac{1}{4}$ .     | (12) $1\frac{13}{30}$ .      |
| (13) $\frac{357}{4000}$ . | (14) $\frac{1}{10}$ .     | (15) $\frac{5}{14}$ .    | (16) $6\frac{2}{3}$ .        |
| (17) $\frac{89}{1000}$ .  | (18) $1\frac{10}{17}$ .   | (19) $\frac{1}{4}$ .     | (20) $5\frac{6}{65}$ .       |
| (21) $1\frac{41}{120}$ .  | (22) $11\frac{13}{17}$ .  | (23) $\frac{47}{120}$ .  | (24) $\frac{1}{84}$ .        |
| (25) $1\frac{1}{35}$ .    | (26) $\frac{7}{7}$ .      | (27) $\frac{1}{100}$ .   | (28) $1\frac{9}{10}$ .       |
| (29) $\frac{5}{8}$ .      | (30) $\frac{267}{6200}$ . | (31) $2\frac{55}{100}$ . | (32) $3\frac{4273}{10000}$ . |
| (33) $2\frac{1}{4}$ .     | (34) $15\frac{1}{2}$ .    | (35) $6\frac{3}{8}$ .    | (36) $\frac{7}{2}$ .         |
| (37) $1\frac{1}{8}$ .     | (38) $3\frac{37}{40}$ .   | (39) $\frac{4}{3}$ .     | (40) $1\frac{51}{20}$ .      |
| (41) $\frac{3}{8}$ .      | (42) $\frac{1}{8}$ .      | (43) $\frac{7}{8}$ .     | (44) $4\frac{9}{100}$ .      |
| (45) $\frac{91}{150}$ .   | (46) $\frac{5}{8}$ .      | (47) $\frac{375}{640}$ . | (48) $1\frac{38}{401}$ .     |
| (49) $1\frac{1}{10}$ .    | (50) $1\frac{95}{200}$ .  |                          |                              |

## Ex. XV.

- |                       |                               |                        |
|-----------------------|-------------------------------|------------------------|
| (1) $1\frac{9}{10}$ . | (2) $1\frac{1}{2}$ .          | (3) $3\frac{13}{10}$ . |
| (4) $\frac{1}{2}$ .   | (5) £2. 13. $1\frac{1}{2}$ s. | (6) £1. 4. 0.          |

- |                                 |   |   |
|---------------------------------|---|---|
| (7) £14. 4. 10½.                | (8) 2½.                                   | (9) 21¾.                                    |
| (10) 1 yd. 3¼ in.               | (11) 3 hrs. 25½ min.                      |   |
| (12) 33 ac. 1 r. 13 p. 10⅞ yds. |   | (13) £34. 1. 3.                             |
| (14) 30⅞.                       | (15) £182.                                | (16) £558. 9. 9¾.                           |
| (17) £8. 19. 7⅞.                | (18) 4s. 7⅞d.                             | (19) £3. 15. 0.                             |
| (20) 24⅞.                       | (21) 18 ft.                               | (22) 8⅞.                                    |
| (23) ⅞.                         | (24) 7.                                   | (25) 8s. 7⅞d.                               |
| (26) 23⅞.                       | (27) 50 times.                            | (28) £2. 14. 0.                             |
| (29) 44000.                     | (30) £121. 10. 11⅓.                       | (31) ⅓.                                     |
| (32) 2¼d.                       | (33) 2¼.                                  | (34) £255. 12. 6. gain.                     |
| (35) £3791. 15. 6.              | (36) 4⅞.                                  | (37) 1⅞.                                    |
| (38) 1s. 1¾d.                   | (39) £91. 12. 0.                          | (40) A. 13s.; B. 8s.                        |
| (41) 21⅞.                       | (42) 1⅞.                                  | (43) 1⅞.                                    |
| (44) 1½.                        | (45) 3⅞.                                  | (46) 1⅞.                                    |
| (47) 19.                        | (48) £21. 18. 6½.                         |   |
| (49) 7 bus. 1 pk. 1 gal. 2 qts. |   | (50) 5 miles.                               |
| (51) 77806⅞ gals.               | (52) 121⅞.                                | (53) 1⅞.                                    |
| (54) 1⅞.                        | (55) 121⅞.                                | (56) £2. 10. 0.                             |
| (57) Latter by 1⅞.              | (58) 3⅞.                                  | (59) 4⅞.                                    |
| (60) £27. 11. 7½.               | (61) 383⅞.                                | (62) 2⅞.                                    |
| (63) 300 bales.                 | (64) 1 ac. 2 r. 5⅞ p.                     | (65) 10000.                                 |
| (66) 4½d.                       | (67) 276480 rev.                          | (68) 1⅞.                                    |
| (69) 1 ft. 4⅞ in.               | (70) 66⅞ tons.                            | (71) 6596 and 4947.                         |
| (72) 84586⅞.                    | (73) 91 miles.                            | (74) 7000 lbs. Troy.                        |
| (75) 95 ac. 2 r. 0⅞ p.          | (76) 3⅞.                                  | (77) 720.                                   |
| (78) 19s. 1⅞d. gain.            | (79) 2⅞.                                  | (80) $\frac{693, 462, 792, 308, 630}{1386}$ |
| (81) 17280 times.               | (82) 1⅞.                                  | (83) 5s. 2⅞d.                               |
| (84) 29⅞.                       | (85) 30.                                  | (86) £25. 0. 11⅞.                           |
| (87) £2. 9. 0.                  | (88) £1. 6. 10½.                          | (89) ⅞.                                     |
| (90) 5s. 2⅞d.                   | (91) 10 tons 4 cwt. 3 qrs. 14 lbs. 10 oz. | (94) £26. 5. 0.                             |
| (92) 154.                       | (93) 2⅞.                                  | (97) £2⅞.                                   |
| (95) 4⅞.                        | (96) £157. 8. 2.                          | (100) 1⅞.                                   |
| (98) 1 c. ft. 61⅞ in.           | (99) £11. 0. 11⅞.                         |   |

## DECIMAL FRACTIONS.

## Ex. I.

- |                              |                            |                      |
|------------------------------|----------------------------|----------------------|
| (1) .3, .03, .003.           | (2) .07, .0007, .07.       | (3) 1.9, 1.76, .001. |
| (4) 11.1, 1.09, .1071.       | (5) .107, .9, .11, .01569. |                      |
| (6) .0071, .081496, .000031. | (7) 2.3.                   | (8) 1.8987.          |
| (9) .61489.                  | (10) .351007.              | (11) 6.2513.         |

- |                 |                |                |
|-----------------|----------------|----------------|
| (12) 071141.    | (13) 5·610051. | (14) 3·111.    |
| (15) 5·165019.  | (16) 036333.   | (17) 3·10331.  |
| (18) 79·896562. | (19) 150139.   | (20) 9·287037. |
| (21) 10·989.    | (22) 036963.   | (23) 000032.   |
| (24) 5·741.     | (25) 6·000281. | (26) 0004284.  |
| (27) 6229.      | (28) 0689086.  | (29) 1·001011. |
| (30) 004033.    |                |                |

## Ex. II.

- |  |   |
|--|---|
| (1) $\frac{1}{2}, \frac{1}{20}, \frac{1}{2000}.$                 | (2) $\frac{4}{5}, \frac{81}{100}, \frac{81}{10000},$                  |
| (3) $\frac{8}{10}, \frac{8}{1000}, \frac{8}{1000000}.$           | (4) $\frac{68}{200}, \frac{517}{1000}, \frac{43}{50}.$                |
| (5) $\frac{19}{200}, \frac{143}{2000}, \frac{1007}{50000}.$      | (6) $\frac{257}{800}, \frac{1017}{1250}, \frac{223}{500}.$            |
| (7) $\frac{379}{50000}, \frac{2131}{100000}, \frac{959}{15525}.$ | (8) $\frac{110979}{500000}, \frac{6903}{10000}, \frac{8157}{100000}.$ |
| (9) $\frac{303}{1000}, \frac{33}{100}, \frac{3303}{10000}.$      | (10) $\frac{3031}{100000}, \frac{31}{71000}, \frac{2}{2000}.$         |
| (11) $\frac{37}{50}, \frac{819}{1000}, \frac{5101}{10000}.$      | (12) $\frac{73}{1000}, \frac{7003}{100000}, \frac{70}{100}.$          |
| (13) $\frac{529}{1250}, \frac{403}{2000}, \frac{7}{4000}.$       | (14) $\frac{8103}{100000}, \frac{4313}{1000}, \frac{3103}{100000}.$   |
| (15) $\frac{827}{100}, \frac{5903}{500}, \frac{56003}{60000}.$   | (16) $\frac{367}{100}, \frac{75013}{7000}, \frac{83}{400}.$           |
| (17) $\frac{21}{1000}, \frac{1}{50}, \frac{7}{400}.$             | (18) $\frac{713}{1000}, \frac{51903}{10000}, \frac{21}{1000}.$        |
| (19) $\frac{44041}{10000}, \frac{440}{100}, \frac{41}{10000}.$   | (20) $\frac{371870}{250000}, \frac{503}{1000}, \frac{30071}{100000}.$ |

## Ex. III.

- |                   |                  |                   |
|-------------------|------------------|-------------------|
| (1) 26·3.         | (2) 2·186.       | (3) 2·6109.       |
| (4) 199·046.      | (5) 1341·561.    | (6) 6·3615.       |
| (7) 378·6131.     | (8) 32·79125.    | (9) 120·8065.     |
| (10) 85·86433.    | (11) 80·5847.    | (12) 59·8366.     |
| (13) 19·88626.    | (14) 295·7271.   | (15) 13·29486.    |
| (16) 10077·29699. | (17) 363·115.    | (18) 2170·0457.   |
| (19) 344·593.     | (20) 995·8571.   | (21) 2623·952038. |
| (22) 4155·422.    | (23) 208·256807. | (24) 223·3782.    |
| (25) 3400·771.    | (26) 120·403.    | (27) 878·368.     |
| (28) 581·89.      | (29) 173·0036.   | (30) 702·107.     |
| (31) 882·119.     | (32) 481·23701.  | (33) 9033·071.    |
| (34) 1005·0962.   | (35) 294·4883.   | (36) 2·93253.     |
| (37) 8·12321.     | (38) 1783·378.   | (39) 8828·1684.   |
| (40) 1274·77.     |                  |                   |

## Ex. IV.

- |               |               |              |
|---------------|---------------|--------------|
| (1) 058.      | (2) 18971.    | (3) 11·212.  |
| (4) 52·5564.  | (5) 55·6632.  | (6) 2·41146. |
| (7) 79·83685. | (8) 13·69631. | (9) 11·923.  |
| (10) 806423.  | (11) 18·3169. | (12) 3·3024. |
| (13) 54·3249. | (14) 2·7441.  | (15) 117864. |

(16) 678·171.	(17) ·12084.	(18) 5·86024.
(19) ·99687.	(20) ·219683.	(21) 8·665.
(22) 47·9809.	(23) ·09683.	(24) 272·2827.
(25) 7·09484.	(26) ·03035039.	(27) 3·340526.
(28) ·623967.	(29) ·395614.	(30) ·51635.
(31) 1·79429.	(32) 4·0444.	(33) 13·30187.
(34) 2·23224.	(35) 11·206157.	(36) 489·99986.
(37) ·005993.	(38) 5·204463.	(39) ·671704.
(40) 1·8038.	(41) ·992864.	(42) 11·483.
(43) 786·214.	(44) ·09914.	(45) ·20994.
(46) 2403·69.	(47) 8·1539.	(48) 31·631.
(49) ·1431.	(50) ·003921.	

## Ex. V.

(1) 17·6.	(2) 68·026.	(3) 14·625.
(4) 2·61.	(5) 3·4466.	(6) ·0025.
(7) ·0676.	(8) ·15125.	(9) 82·1.
(10) 5·37219.	(11) 2411·8.	(12) ·001764.
(13) 61·91418.	(14) 70·1165.	(15) ·123857.
(16) 96·22404.	(17) 1704·03.	(18) 362·7119.
(19) ·000147.	(20) 8·2940365.	(21) ·0835935.
(22) ·12817832.	(23) ·000017663.	(24) 812765·355.
(25) 2·5689672.	(26) ·34.	(27) ·00532.
(28) 133·46322.	(29) ·33165.	(30) 15·547248.
(31) ·09370536.	(32) 7·742.	(33) 138·188413.
(34) 24·162633971.	(35) ·0147147.	(36) ·053676.
(37) 10·627584.	(38) 257·8011633.	(39) 5·20542.
(40) 10·3823.	(41) 15·686.	(42) ·043188.
(43) ·57574.	(44) ·0035378.	(45) 108·243216.
(46) 139·968.	(47) ·068475.	(48) ·00000005396.
(49) 9·12850715.	(50) ·361.	

## Ex. VI.

(1) ·18144.	(2) ·12096.	(3) ·09072.
(4) ·072576.	(5) ·06048.	(6) ·05184.
(7) ·04536.	(8) ·04032.	(9) 181·44.
(10) 120·96.	(11) 90·72.	(12) 72·576.
(13) 60·48.	(14) 51·84.	(15) 45·36.
(16) 40·32.	(17) 181·44.	(18) 120·96.
(19) 90·72.	(20) 72·576.	(21) 604·8.
(22) 518·4.	(23) 45·36.	(24) 4·032.
(25) 403·2.	(26) 10.	(27) 3·4.

- |                  |                     |                  |
|------------------|---------------------|------------------|
| (28) 3·867.      | (29) ·011564.       | (30) ·0225.      |
| (31) ·0000276.   | (32) 30·4315, &c.   | (33) 150.        |
| (34) ·4525.      | (35) 1022·3.        | (36) 8·94, &c.   |
| (37) 1250.       | (38) ·22662, &c.    | (39) ·00085, &c. |
| (40) 3438·125.   | (41) 20811·138, &c. | (42) 133·3, &c.  |
| (43) 98·885, &c. | (44) ·00000414, &c. | (45) ·00889093.  |
| (46) 21·245, &c. | (47) 8391·608, &c.  | (48) 52·08.      |
| (49) 10·252, &c. | (50) 21·08.         |                  |

## Ex. VII.

- |                      |                    |                     |
|----------------------|--------------------|---------------------|
| (1) ·53, ·75.        | (2) ·3125, ·025.   | (3) ·75, 2·375.     |
| (4) ·28, 2·22.       | (5) ·6, ·4.        | (6) 2·6, ·484375.   |
| (7) ·336, 1·2656.    | (8) ·32, 1·3746.   | (9) ·921875, 1·23.  |
| (10) ·21875, ·1448.  | (11) 3·25, 5·5.    | (12) 1·9375, 3·875. |
| (13) 4·34375, 1·375. | (14) 3·375.        | (15) 4·2.           |
| (16) ·25.            | (17) ·31201171875. | (18) 2·77265625.    |
| (19) ·2673.          | (20) ·0001953125.  | (21) ·65.           |
| (22) ·83.            | (23) 1·03125.      | (24) 4·75.          |
| (25) ·65625.         | (26) 2·0625.       | (27) 3·2484375.     |
| (28) 78·75.          | (29) 4.            | (30) 1·375.         |
| (31) 12·1875.        | (32) 2490.         | (33) 1·2.           |
| (34) ·005.           | (35) 1·104375.     | (36) 3·6.           |
| (37) 25·4375.        | (38) 3·75.         | (39) ·24.           |
| (40) 2·8125.         |                    |                     |

## Ex. VIII.

- |                                     |                               |
|-------------------------------------|-------------------------------|
| (1) ·3, ·16, ·142857.               | (2) ·2, ·714285, ·6.          |
| (3) ·06, ·605, ·10185.              | (4) ·63, ·3571428, ·18.       |
| (5) ·72, ·384615, ·857142.          | (6) 1·3, ·83, ·2142857.       |
| (7) 7·7142857, 2·7303.              | (8) ·94, ·2142857, ·6.        |
| (9) ·108, 4·376068.                 | (10) 1·142857, 1·8.           |
| (11) 4·03, 11·03571428.             | (12) 6·0571428, 3·809523.     |
| (13) 3·692307, ·54.                 | (14) 13·3, ·5045.             |
| (15) ·972, ·476190.                 | (16) 3·4, 1·06.               |
| (17) ·076923, ·0588235294117647.    |                               |
| (18) ·0434782608695652173913, ·037. | (19) ·129032258064516, 1·074. |
| (20) ·081, 1·230769.                | (21) 1·0099, ·315476190.      |
| (22) ·39285714, ·765432098.         | (23) 2·194, ·3.               |
| (24) ·446428571, ·672.              | (25) ·3095238, ·769230.       |
| (26) 10·142857, ·952380.            | (27) 1·285714, ·295138.       |
| (28) 1·3, 1·6.                      | (29) 26·074, 8·29.            |
| (30) ·73142857, ·032258064516129.   |                               |

## Ex. IX.

- |  |   |  |
|--|---|--|
| (1) $\frac{1}{3}, \frac{5}{33}.$             | (2) $\frac{7}{33}, \frac{17}{99}.$        | (3) $\frac{6}{11}, \frac{16}{99}.$             |
| (4) $\frac{3}{37}, \frac{91}{111}.$          | (5) $\frac{5}{11}, \frac{111}{111}.$      | (6) $\frac{1}{16}, \frac{67}{96}.$             |
| (7) $\frac{37}{990}, \frac{10}{300}.$        | (8) $\frac{301}{990}, \frac{23}{990}.$    | (9) $\frac{1}{100}, \frac{27}{100}.$           |
| (10) $\frac{31}{99}, \frac{41}{99}.$         | (11) $\frac{3}{7}, \frac{143}{4600}.$     | (12) $\frac{301}{990}, 21\frac{1}{33}.$        |
| (13) $52\frac{6}{99}, 17\frac{7}{99}.$       | (14) $63\frac{79}{990}, 8\frac{43}{990}.$ | (15) $17\frac{18}{99}, 2\frac{1}{33}.$         |
| (16) $11\frac{618}{990}, 11\frac{513}{990}.$ | (17) $31\frac{41}{44}, 5\frac{23}{990}.$  | (18) $12\frac{1205}{1000}, 4\frac{882}{4000}.$ |
| (19) $22\frac{7}{22}, 4\frac{18}{22}.$       | (20) $\frac{10}{99}, \frac{1001}{9999}.$  | (21) $3\frac{647}{2475}, 7\frac{61}{1980}.$    |
| (22) $13\frac{6004}{9900}, 9\frac{21}{100}.$ | (23) $67\frac{27}{99}, 5\frac{16}{990}.$  | (24) $53\frac{16}{495}, 6\frac{697}{495}.$     |
| (25) $34\frac{001}{990}, 3\frac{37}{111}.$   | (26) $15\frac{8}{33}, 52.$                | (27) $16\frac{31}{990}, 8\frac{33}{990}.$      |
| (28) $12\frac{7}{22}, \frac{283}{990}.$      | (29) $\frac{13}{99}, \frac{4}{18}.$       | (30) $5\frac{1}{6}, 3\frac{9}{45}.$            |
| (31) $7\frac{3}{9}, 6\frac{11}{6}.$          | (32) $\frac{3}{99}, 6\frac{2}{99}.$       | (33) $7\frac{8}{99}.$                          |
| (34) $\frac{1723}{9900}.$                    | (35) $\frac{1}{3}.$                       | (36) $12\frac{8767}{990}.$                     |
| (37) $\frac{3101}{3333}.$                    | (38) $\frac{4}{37}.$                      | (39) $\frac{5}{14}.$                           |
| (40) $\frac{25}{134}.$                       | (41) $3\frac{17}{999}.$                   | (42) $5\frac{555}{1666}.$                      |
| (43) $1\frac{17}{9900}.$                     | (44) $11\frac{6737}{3333}.$               | (45) $53\frac{30402}{9900}.$                   |
| (46) $\frac{7925}{99000}.$                   | (47) $\frac{1}{14}.$                      | (48) $\frac{15794}{240075}.$                   |
| (49) $4\frac{613}{9900}.$                    | (50) $\frac{84002}{999900}.$              | (51) $\frac{30273}{99900}.$                    |
| (52) $\frac{107}{9900}.$                     | (53) $\frac{1}{10}.$                      | (54) $\frac{1}{99}.$                           |
| (55) $\frac{5}{26}.$                         | (56) $\frac{1837789}{24099760}.$          | (57) $\frac{1}{31}.$                           |
| (58) $\frac{178}{33325}.$                    | (59) $3\frac{1}{10}.$                     | (60) $\frac{1}{17}.$                           |

## Ex. X.

- |                |                |                |
|----------------|----------------|----------------|
| (1) 20·88091.  | (2) ·39833.    | (3) 16·41805.  |
| (4) 60·49949.  | (5) 550·08151. | (6) 34·15596.  |
| (7) 8·51847.   | (8) 76·77751.  | (9) 11·75817.  |
| (10) 14·12679. | (11) ·05876.   | (12) ·23036.   |
| (13) ·37222.   | (14) 1·49076.  | (15) 2·89839.  |
| (16) ·52468.   | (17) ·17459.   | (18) 2·94888.  |
| (19) ·02302.   | (20) ·54586.   | (21) ·01111.   |
| (22) ·91734.   | (23) 1·73863.  | (24) ·96353.   |
| (25) 7·15179.  | (26) 1.        | (27) 3·23547.  |
| (28) ·13761.   | (29) ·03731.   | (30) 35·86424. |
| (31) ·01952.   | (32) ·00652.   | (33) ·04594.   |
| (34) ·03948.   | (35) ·25793.   | (36) 56·31427. |
| (37) ·00041.   | (38) ·05263.   | (39) ·00298.   |
| (40) ·00460.   | (41) 5·15094.  | (42) 34·5.     |
| (43) ·46359.   | (44) 7·03411.  | (45) ·03293.   |
| (46) 2·88184.  | (47) ·03911.   | (48) 3·44424.  |
| (49) ·01563.   | (50) ·00100.   |                |

## Ex. XI.

- |  |  |
|--|--|
| (1) 1s. 6d.; £2. 5. 0.                   | (2) 3½d.; £6. 12. 6.                         |
| (3) 3s. 4·944d.; £19. 2. 4·8.            | (4) 11·52d.; £2. 10. 5½.                     |
| (5) £2. 11. 4·8; 11·43d.                 | (6) £1. 8. 8·136; £111. 8. 4·8.              |
| (7) £42. 6. 11·6; £24. 3. 0.             | (8) £2. 13. 10·38; 14s. 2·8d.                |
| (9) £12. 10. 6·36; £2. 15. 1½.           | (10) £1. 19. 0¾; 2s. 10·056d.                |
| (11) 7 cwt. 2 qrs. 25·76 lbs.            | (12) 2 tons 8 cwt.                           |
| (13) 5 m. 66 yds.                        | (14) 1 lb. 3 oz. 8 dwts. 16·8 grs.           |
| (15) 5·068 poles.                        | (16) 2 ac. 13 p.                             |
| (17) 11 yrs. 100 dys. 9 h. 39 m. 25·2 s. |  |
| (18) 5 cub. yds. 5 ft. 224·64 in.        | (19) 17 ac. 3 r. 12·23 poles.                |
| (20) 6 lbs. 3 oz. 13·12 drs.             | (21) 3 h. 18 m. 21·6 s.                      |
| (22) 1 pk. 2 qts.                        | (23) 2 tons 2 cwt. 2 qr. 21·7 lbs.           |
| (24) 3 tons 18 cwt. 1 qr. 12·992 lbs.    | (25) 1 ton 13 cwt. 1 qr. 22·94 lbs.          |
| (26) 2 yds. 1 ft. 2½ in.                 | (27) 6 fur. 3½ poles.                        |
| (28) 1·13 poles.                         | (29) 61 sq. m. 48 ac. 3 r. 33·6 poles.       |
| (30) 6 cwt. 1 qr. 2·464 lbs.             | (31) 5 yds. 2 ft. 11·892 in.                 |
| (32) 2 sq. yds. 8 ft. 12·78 in.          | (33) 17 hrs. 52 m. 39·36 s.                  |
| (34) 23 lbs. 10 oz. 11 dwts. 10·704 grs. | (35) 58 m. 7 fur. 23·52 poles.               |
| (36) 11 hhds. 8 gals. 0·13 qts.          | (37) 675 m. 2 fur. 20·8 poles.               |
| (38) 1 bar. 3 gals. 0·24 qts.            | (39) 49 m. 3 fur. 36·6 poles nearly.         |
| (40) 6 cwt. 2 qrs. 8·19 lbs.             | (41) £3. 3. 4½. (42) 8s. 0·03d.              |
| (43) £2. 14. 6·54.                       | (44) £18. 1. 0·3. (45) £1. 4. 10½.           |
| (46) £7. 13. 8·55.                       | (47) £1. 1. 9·529. (48) £375. 7. 6.          |
| (49) £5. 7. 7·93.                        | (50) 3s. 3·4d. (51) £3. 0. 3.                |
| (52) 21 tons 17 cwt.                     | (53) 35 tons 9 cwt. 24 lbs. (54) 1 ft. 6 in. |
| (55) 40 yds.                             | (56) 4 min. 2 sec.                           |
| (57) 4 dys. 23 h. 20 m.                  | (58) 7 lbs. (59) £9. 7. 11.                  |
| (60) 16 dwts. 8 grs.                     |  |

## Ex. XII.

- |               |                   |                  |                |
|---------------|-------------------|------------------|----------------|
| (1) ·125.     | (2) ·3.           | (3) ·16.         | (4) ·125.      |
| (5) ·1375.    | (6) ·16052, &c.   | (7) 8·75.        | (8) ·1142857.  |
| (9) ·63.      | (10) 2·16015, &c. | (11) 25.         | (12) ·04.      |
| (13) ·142857. | (14) ·29583.      | (15) ·1452093.   | (16) ·025.     |
| (17) ·714285. | (18) ·010185.     | (19) ·77857142.  | (20) ·172, &c. |
| (21) ·215.    | (22) ·175.        | (23) ·2583.      | (24) ·015.     |
| (25) ·83.     | (26) ·665625.     | (27) ·29.        | (28) 2·7.      |
| (29) ·36.     | (30) ·04583.      | (31) ·00826, &c. | (32) ·125.     |
| (33) ·025.    | (34) 1·221875.    | (35) ·2027.      | (36) ·037.     |
| (37) ·09375.  | (38) 1·2916.      | (39) ·2692307.   | (40) ·22916.   |



- |                 |                  |                   |                 |
|-----------------|------------------|-------------------|-----------------|
| (41) ·0464, &c. | (42) ·02128, &c. | (43) 9·88235, &c. | (44) ·0095, &c. |
| (45) ·82285714. | (46) 1·21527.    | (47) ·13095238.   | (48) ·396825.   |
| (49) ·4583.     | (50) ·416.       | (51) ·21078, &c.  | (52) ·4182.     |
| (53) ·3263, &c. | (54) 15·96.      | (55) ·00613, &c.  | (56) ·666.      |
| (57) 16·8595.   | (58) ·125.       | (59) ·07875.      | (60) ·2886, &c. |

## Ex. XIII.

- (2) Five tenths, one hundredth, three thousandths, and two ten-thousandths.
- (3) To remove the dec. point one, two, or three places respectively towards the right.
- |  |  |
|--|--|
| (4) ·0031, ·001037.  | (5) $1\frac{31}{1000}$ , $1\frac{1037}{10000}$ , $1\frac{1037}{100000}$ , $7\frac{1037}{100000}$ . |
| (6) ·3, ·009, ·0705, ·04, ·6.  | (7) 9·3179. (8) ·006783.   |
| (9) 10·24068. (10) 360.  | (11) 1. (12) 3. (13) 1·3.  |
| (14) ·000224595.   | (15) $\frac{224595}{1000000}$ . (16) 1s. 3 $\frac{3}{4}$ d.  |
| (17) 5s. 3d.   | (18) 80 times. (19) ·096774193548387.  |
| (20) ·142857.  | (21) £37. 7. 3·936. (22) £51. 7. 3·27.   |
| (23) 1 cwt. 3 qrs. 14 lbs.   | (24) 2935 ac. 337·9025 sq. yds.  |
| (25) 54 m. 6·36 fur.   | (26) 1s. 11·3d. (27) 63 ft.  |
| (28) 10000.  | (29) 7s. 4·14708d. (30) ·2222421.  |
| (31) 2·563i.   | (32) 5·3024375.  |
| (33) 8 cwt. 2 qrs. 2·89 lbs.   | (34) £12. 4. 1·08.   |
| (35) ·1789130434782608695652.  | (36) 14·309325 c. ft. (37) $\frac{6777}{100000}$ .   |
| (38) Water 8·4 lbs. F.F. 8·76 lbs., HG. 39·84 lbs. Acc. 2·04 lbs. and Min. M. ·96 lbs. |  |
- |  |                                       |                                 |
|--|---------------------------------------|---------------------------------|
| (39) 1002.                                 | (40) ·00556i.                         | (41) 5s. 5·772d.                |
| (42) ·000132, &c.                          | (43) ·38515625.                       | (44) ·142857.                   |
| (45) $\frac{7}{8}$ .                       | (46) 6008·13 c. ft.                   | (47) ·439, &c.                  |
| (48) £628. 14. 9·78.                       | (49) 1 ton 5 cwt. 2 qrs. 13·3083 lbs. |                                 |
| (50) ·23957, &c.                           | (51) 111·1111.                        | (52) $\frac{1}{31}$ .           |
| (53) £21. 5. 11·412.                       | (54) ·000000000024, &c.               | (55) 71·577 degrees.            |
| (56) £125, ·7s., ·714285d.                 | (57) ·25.                             | (58) 58150.                     |
| (59) 820·125.                              | (60) 60 shillings.                    | (61) £49375.                    |
| (62) £3. 8. 0.                             | (63) £1. 0. 0.                        | (64) £64. 0. 7.                 |
| (65) 2 qrs. 22 lbs.                        | (66) £6486. 19. 9.                    | (67) £10. 11. 3 $\frac{1}{2}$ . |
| (68) ·19723, &c.                           | (69) £4. 7. 6·6.                      | (70) 4320 times.                |
| (71) £73. 5. 6·6.                          | (72) ·48125.                          | (73) £1543. 17. 6·351.          |
| (74) 4 dwts. 10·1472 grs.                  | (75) 1·7407226291.                    |                                 |
| (76) ·9285714, ·93, ·9375 and 1·009615384. | (77) £3. 4. 9·675.                    |                                 |
| (78) ·0006747257, &c.                      | (79) 11 poles 24·684 yds.             | (80) $\frac{18181}{100000}$ .   |
| (81) 106 tons 9 cwt. 1 qr. 14·56 lbs.      | (82) £7. 10. 1·538.                   |                                 |

- (83) .88. (84) 18 cwt. 11·2 lbs. (85) .06914, &c.  
 (86) 2594·594 times. (87) 70 feet. (88) 82·992 lbs. and 17·36 lbs.  
 (89) 1 qr. 21·859 lbs. (90) 61·7962. (91) 1·2. (92) .016.  
 (93) 13706352 cub. ft. (94) £38. 19. 4·875. (95) 35 dys. 7h. 58m. 4·8 s.  
 (96) 1·05492, &c. (97) .4643518. (98) .468.  
 (99) £119. 3. 3·21. (100) £4. 13. 0.

## PRACTICE.

## SIMPLE PRACTICE.

- |                      |                     |                       |
|----------------------|---------------------|-----------------------|
| (1) £9. 0. 0.        | (2) £3. 7. 0.       | (3) £4. 14. 8.        |
| (4) £2. 8. 9.        | (5) £2. 1. 3.       | (6) £2. 10. 10½.      |
| (7) £2. 8. 8.        | (8) £2. 19. 4½.     | (9) £8. 0. 4½.        |
| (10) £2. 14. 4½.     | (11) £3. 12. 6.     | (12) £9. 10. 0.       |
| (13) £38. 0. 0.      | (14) £103. 10. 0.   | (15) £63. 17. 6.      |
| (16) £99. 3. 4.      | (17) £183. 12. 0.   | (18) £188. 3. 6.      |
| (19) £529. 7. 6.     | (20) £210. 2. 10.   | (21) £80. 8. 10.      |
| (22) £86. 19. 6.     | (23) £554. 19. 6.   | (24) £318. 6. 10½.    |
| (25) £160. 6. 0.     | (26) £484. 3. 7½.   | (27) £358. 9. 4.      |
| (28) £842. 13. 4½.   | (29) £513. 6. 8.    | (30) £258. 7. 6.      |
| (31) £592. 10. 0.    | (32) £13218. 6. 8.  | (33) £143. 6. 8.      |
| (34) £20635. 8. 4.   | (35) £1988. 5. 0.   | (36) £3449. 12. 0.    |
| (37) £9195. 3. 0.    | (38) £1524. 6. 8.   | (39) £1768. 5. 10.    |
| (40) £2346. 1. 8.    | (41) £5030. 8. 6.   | (42) £96833. 17. 4.   |
| (43) £4255. 10. 9.   | (44) £422. 13. 6.   | (45) £2923. 0. 9.     |
| (46) £10589. 6. 8.   | (47) £2910. 8. 4.   | (48) £5098. 0. 10.    |
| (49) £8086. 16. 8.   | (50) £4070. 18. 6.  | (51) £9881. 10. 3.    |
| (52) £12921. 15. 4½. | (53) £1112. 3. 9½.  | (54) £12732. 6. 10½.  |
| (55) £12641. 10. 1.  | (56) £9267. 17. 8½. | (57) £2553. 13. 6.    |
| (58) £40821. 8. 6.   | (59) £11824. 15. 2. | (60) £124. 14. 0½.    |
| (61) £86. 19. 0¾.    | (62) £225. 17. 7¾.  | (63) £2696. 5. 0.     |
| (64) £6574. 13. 4½.  | (65) £963. 0. 0.    | (66) £16080. 15. 1½.  |
| (67) £3572. 17. 4½.  | (68) £1462. 5. 10½. | (69) £474. 17. 7.     |
| (70) £884. 5. 3.     | (71) £199. 12. 1½.  | (72) £593. 16. 6½.    |
| (73) £1419. 7. 1½.   | (74) £5778. 0. 0.   | (75) £565. 10. 9.     |
| (76) £1552. 2. 1.    | (77) £4277. 17. 8.  | (78) £3031. 19. 8½.   |
| (79) £5460. 16. 8.   | (80) £13752. 0. 0.  | (81) £2643. 3. 9.     |
| (82) £7130. 12. 9.   | (83) £3107. 10. 9.  | (84) £10302. 0. 0.    |
| (85) £2046. 12. 3¼.  | (86) £1919. 0. 0.   | (87) £181919. 14. 9½. |
| (88) £29621. 2. 2¼.  | (89) £13. 13. 5.    | (90) £147. 12. 7½.    |
| (91) £498. 9. 4½.    | (92) £129. 13. 11¼. | (93) £347. 9. 3.      |
| (94) £121. 1. 4.     | (95) £613. 10. 7.   | (96) £239. 17. 4.     |

(97) £571. 17. $1\frac{7}{8}$ .	(98) £12192. 6. $2\frac{4}{5}$ .	(99) £181. 18. $1\frac{1}{2}$ .
(100) £359. 0. $6\frac{3}{4}$ .	(101) £34. 15. 4.	(102) £592. 17. 6.
(103) £393. 15. 0.	(104) £927505. 6. 0.	(105) £206. 7. $4\frac{1}{2}$ .
(106) £159. 10. $8\frac{1}{4}$ .	(107) £400. 7. $2\frac{1}{4}$ .	(108) £64. 8. $0\frac{3}{4}$ .
(109) £397. 10. 10.	(110) £587. 2. $6\frac{1}{2}$ .	(111) £1112083. 6. 8.
(112) £250. 2. 4.	(113) £728. 2. $2\frac{1}{4}$ .	(114) £12495. 19. $6\frac{3}{4}$ .
(115) £39. 6. $11\frac{1}{2}$ .	(116) £19597. 13. 6.	(117) £3845. 17. $5\frac{1}{2}$ .
(118) £2850. 9. 4.	(119) £754. 0. 0.	(120) £49. 7. 0.
(121) £72. 19. $5\frac{1}{4}$ .	(122) £543. 17. $3\frac{3}{8}$ .	(123) £2596. 7. 9.
(124) £5389. 16. $8\frac{5}{8}$ .	(125) £3657. 4. 6.	(126) £22911. 13. 4.
(127) £1121. 11. 6.	(128) 5s. $7\frac{1}{2}d$ .	(129) £14. 16. $1\frac{1}{2}$ .
(130) £139. 2. $9\frac{1}{2}$ .	(131) £69. 8. 4.	(132) £692. 6. 6.
(133) £3. 0. $7\frac{3}{4}$ .	(134) £28. 10. $7\frac{1}{2}$ .	(135) £330. 2. $5\frac{1}{4}$ .
(136) £25798. 10. 0.	(137) £1. 4. $1\frac{3}{4}$ .	(138) £10034. 16. 4.
(139) £1148. 8. $6\frac{1}{2}$ .	(140) £423. 19. $4\frac{1}{2}$ .	(141) £117. 18. $1\frac{1}{2}$ .
(142) £177. 0. $1\frac{1}{2}$ .	(143) £163. 3. $4\frac{1}{2}$ .	(144) £510. 0. 0.
(145) £147. 9. 9.	(146) £324. 16. $10\frac{1}{2}$ .	(147) £7237. 19. $9\frac{1}{2}$ .
(148) £4. 19. $10\frac{1}{4}$ .	(149) £21. 8. $10\frac{1}{4}$ .	(150) £25. 0. 0.

## COMPOUND PRACTICE.

(1) £1. 12. 6.	(2) £7. 9. 10.	(3) £11. 4. 7.
(4) £4. 14. 6.	(5) £221. 17. 6.	(6) £5. 18. $1\frac{1}{2}$ .
(7) £53. 10. $5\frac{1}{4}$ .	(8) £995. 6. $10\frac{1}{2}$ .	(9) £62. 15. $3\frac{3}{4}$ .
(10) £8. 6. $0\frac{3}{4}$ .	(11) £18850. 0. 0.	(12) £946. 1. $10\frac{1}{2}$ .
(13) £24. 12. $8\frac{11}{20}$ .	(14) £3. 15. $4\frac{1}{2}$ .	(15) £8. 7. $7\frac{1}{2}$ .
(16) £184. 2. $11\frac{5}{8}$ .	(17) £63. 10. $4\frac{4}{5}$ .	(18) £441. 18. $8\frac{1}{16}$ .
(19) £1548. 12. $4\frac{1}{2}$ .	(20) £6916. 17. 6.	(21) £54. 2. $6\frac{3}{4}$ .
(22) £71. 5. $3\frac{3}{8}$ .	(23) £2224. 13. $5\frac{2}{3}$ .	(24) £298. 7. $9\frac{2}{7}$ .
(25) £36. 16. $11\frac{3}{4}$ .	(26) £291. 8. $0\frac{3}{10}$ .	(27) £141. 9. $4\frac{5}{8}$ .
(28) £941. 9. $9\frac{9}{7}$ .	(29) £181. 3. $0\frac{7}{8}$ .	(30) £27. 11. $7\frac{1}{4}$ .
(31) £2148. 4. $5\frac{1}{2}\frac{5}{7}$ .	(32) £40. 17. $11\frac{3}{4}\frac{7}{10}$ .	(33) £814. 7. 0.
(34) £21. 15. 9.	(35) £2. 17. $11\frac{1}{4}$ .	(36) £269. 1. $5\frac{5}{8}$ .
(37) £57. 6. $21\frac{3}{16}$ .	(38) £43. 10. 10.	(39) £921. 17. 6.
(40) £16. 17. 4.	(41) £25. 16. $4\frac{7}{8}$ .	(42) £1. 8. $7\frac{1}{2}$ .
(43) £454. 7. 6.	(44) £135. 18. $3\frac{2}{5}$ .	(45) £14. 7. $4\frac{1}{2}$ .
(46) £5. 11. 9.	(47) £63. 7. 6.	(48) £12. 14. $5\frac{1}{4}$ .
(49) £333. 17. $8\frac{2}{3}\frac{9}{7}$ .	(50) £336. 16. $5\frac{1}{4}$ .	(51) £346. 1. $1\frac{1}{8}$ .
(52) £84. 10. $6\frac{3}{8}$ .	(53) £138. 2. 6.	(54) £5312. 12. 0.
(55) £76. 13. 0.	(56) £212. 15. $9\frac{3}{8}$ .	(57) £3. 4. $9\frac{3}{4}$ .
(58) £6. 4. $7\frac{1}{17}$ .	(59) £3. 10. $11\frac{1}{8}$ .	(60) £25661. 6. $1\frac{1}{2}$ .
(61) £8116. 9. $5\frac{91}{100}$ .	(62) £175. 5. 0.	(63) £4. 1. $3\frac{1}{4}$ .

- (64) £16. 15. 9 $\frac{5}{8}$ . (65) £179. 7. 6 $\frac{3}{4}$ . (66) £64. 10. 10 $\frac{5}{12}$ .  
 (67) £7374. 16. 8 $\frac{20}{24}$ . (68) £9. 14. 9 $\frac{1}{2}$ . (69) £2. 2. 11 $\frac{5}{8}$ .  
 (70) £4. 18. 8 $\frac{1}{8}$ . (71) £2. 8. 2 $\frac{25}{120}$ . (72) £7. 6. 2 $\frac{1}{2}$ .  
 (73) £5. 7. 10 $\frac{1}{2}$ . (74) £56. 1. 2 $\frac{5}{8}$ . (75) £1. 18. 11 $\frac{3}{8}$ .  
 (76) £1662. 2. 4 $\frac{1}{2}$ . (77) £1374. 17. 4 $\frac{11}{16}$ . (78) £319. 1. 10 $\frac{1}{20}$ .  
 (79) £5. 18. 9 $\frac{5}{10}$ . (80) £24. 17. 7 $\frac{7}{8}$ . (81) £150. 5. 0 $\frac{1}{2}$ .  
 (82) £5504. 12. 8. (83) £604. 19. 11 $\frac{1}{4}$ . (84) £132. 6. 0.  
 (85) 7s. 3 $\frac{3}{4}$ d. (86) £99608. 0. 9. (87) £2. 7. 6 $\frac{3}{8}$ .  
 (88) £64. 5. 6 $\frac{5}{8}$ . (89) £62. 14. 4. (90) £1980. 15. 9 $\frac{2}{7}$ .  
 (91) £20. 15. 0. (92) £948. 14. 0. (93) £1324. 13. 11 $\frac{1}{7}$ .  
 (94) £29. 18. 6. (95) £6975. 0. 6 $\frac{7}{8}$ . (96) £856. 19. 6 $\frac{3}{10}$ .  
 (97) £35. 7. 3. (98) £163. 15. 7 $\frac{1}{2}$ . (99) £930. 12. 5 $\frac{4}{7}$ .  
 (100) £1430. 2. 9 $\frac{3}{4}$ . (101) £20. 18. 0 $\frac{3}{4}$ . (102) £27. 17. 3 $\frac{1}{2}$ .  
 (103) £101. 0. 10 $\frac{2}{10}$ . (104) £1188. 1. 10 $\frac{1}{2}$ . (105) £196. 15. 1 $\frac{7}{8}$ .  
 (106) £1498. 19. 5 $\frac{5}{8}$ . (107) £4985. 14. 11 $\frac{1}{10}$ .  
 (108) £19. 16. 0 $\frac{3}{8}$ . (109) £3. 6. 8 $\frac{7}{10}$ . (110) £223. 14. 10 $\frac{1}{2}$ .  
 (111) £1327. 13. 9. (112) £25. 7. 3 $\frac{3}{8}$ . (113) £3881. 5. 0.  
 (114) £2. 1. 2 $\frac{7}{12}$ . (115) £116. 10. 7 $\frac{1}{2}$ . (116) £1979. 14. 11.  
 (117) £1444. 19. 0. (118) £1353. 8. 8 $\frac{1}{2}$ . (119) £49. 5. 3 $\frac{9}{20}$ .  
 (120) £253. 15. 3 $\frac{1}{2}$ . (121) 9s. 1 $\frac{1}{10}$ d. (122) 15 tons 18 cwt. 3 qrs.  
 (123) £550. 12. 0. (124) £7. 10. 7.  
 (125) 16 tons 14 cwt. 2 qrs. 21 lbs. (126) 642 c. yds. 6 ft.  
 (127) £6. 17. 3 $\frac{3}{8}$ . (128) £241. 6. 6 $\frac{3}{10}$ . (129) £2019. 6. 6.  
 (130) £17452. 19. 4 $\frac{1}{2}$ . (131) £2367. 1. 3 $\frac{3}{4}$ . (132) 2201 $\frac{3}{10}$  miles.  
 (133) 19s. 9 $\frac{7}{8}$ d. (134) 11s. 0 $\frac{1}{4}$ d. (135) £163. 4. 7 $\frac{1}{2}$ .  
 (136) £7. 2. 3 $\frac{3}{8}$ . (137) £3470. 12. 6. (138) £104. 7. 6.  
 (139) £5. 11. 2 $\frac{7}{8}$ . (140) £65. 0. 0. (141) £16. 9. 8 $\frac{1}{4}$ .  
 (142) £2039. 19. 10 $\frac{1}{2}$ . (143) £95. 11. 10 $\frac{1}{2}$ . (144) £213. 18. 6 $\frac{3}{4}$ .  
 (145) £160. 13. 0 $\frac{1}{2}$ . (146) £353. 8. 9. (147) £259. 3. 9.  
 (148) 11s. 6 $\frac{9}{32}$ d. (149) 68 tons 19 cwt. 6 lbs.  
 (150) 1327 ac. 3 r. 32 p. (151) £44. 4. 3 $\frac{3}{8}$ .  
 (152) £15. 11. 11 $\frac{1}{4}$ . (153) £352. 7. 9 $\frac{3}{4}$ . (154) £1723. 17. 3 $\frac{3}{4}$ .  
 (155) £15. 1. 2 $\frac{5}{8}$ . (156) £375. 8. 3. (157) £239. 9. 0 $\frac{1}{2}$ .  
 (158) £108. 15. 9. (159) £57. 6. 7 $\frac{3}{8}$ . (160) £81. 16. 7 $\frac{1}{2}$ .  
 (161) £1. 0. 1 $\frac{1}{2}$ . (162) £229. 18. 2 $\frac{1}{4}$ . (163) £6. 8. 4 $\frac{5}{8}$ .  
 (164) £613. 18. 9. (165) £68. 10. 1 $\frac{1}{4}$ . (166) £1309. 3. 3.  
 (167) £980. 9. 8 $\frac{1}{4}$ . (168) £54. 4. 6. (169) £4821. 17. 3.  
 (170) 4791 cwt. 1 qr. 20 lbs. (171) £59. 14. 0.  
 (172) £28. 8. 3 $\frac{9}{16}$ . (173) £128. 1. 2 $\frac{7}{10}$ . (174) £231. 0. 0.  
 (175) £29. 6. 3. (176) 94 tons 13 cwt. 3 qrs.  
 (177) £211. 15. 0 $\frac{1}{2}$ . (178) £126. 12. 8 $\frac{1}{4}$ . (179) £6. 13. 5 $\frac{1}{8}$ .

- |                                     |                         |                        |
|-------------------------------------|-------------------------|------------------------|
| (180) £24. 5. 0½.                   | (181) £81. 15. 7.       | (182) £142. 2. 3½.     |
| (183) £22. 6. 11¼.                  | (184) £29. 0. 8½.       | (185) £1. 9. 8¼.       |
| (186) £981. 10. 9¾.                 | (187) £46180. 5. 0.     | (188) £275. 8. 9.      |
| (189) £140. 16. 7⅞.                 | (190) £884. 10. 6¾.     | (191) £31. 3. 6⅞.      |
| (192) £319. 15. 1.                  | (193) £261. 11. 10¼.    | (194) £1072. 10. 0.    |
| (195) £184. 5. 6¾.                  | (196) £3. 3. 8. per qr. |                        |
| (197) £4. 6. 5.                     | (198) £424. 18. 5¼.     | (199) £598. 0. 0.      |
| (200) £45. 12. 6.                   | (201) £11. 5. 0.        | (202) £5813. 2. 1½.    |
| (203) 45 tons 1 cwt. 3 qrs. 14 lbs. |                         | (204) £44. 5. 0.       |
| (205) £40. 12. 6¼.                  | (206) £1. 1. 6.         |                        |
| (207) 3 tons 14 cwt. 1 qr. 24 lbs.  |                         | (208) £38520. 18. 10½. |
| (209) 637 miles.                    | (210) £2217. 17. 1½.    | (211) £28. 2. 11⅞.     |
| (212) £22. 10. 9.                   | (213) 8s. 11¾d.         | (214) £489. 13. 9.     |
| (215) £2. 7. 8.                     | (216) £634. 11. 0¾.     | (217) £44850. 19. 2.   |
| (218) £943. 2. 9¾.                  | (219) £96. 17. 7¼.      | (220) £27832. 1. 9.    |

## BILLS OF PARCELS.

- |                  |                  |                   |
|------------------|------------------|-------------------|
| (1) £2. 6. 5½.   | (2) £4. 8. 2¼.   | (3) £8. 17. 3.    |
| (4) £5. 16. 11¾. | (5) £167. 3. 1.  | (6) £3. 1. 4½.    |
| (7) £33. 15. 5¼. | (8) £1812. 7. 6. | (9) £180. 18. 0.  |
| (10) £8. 9. 1.   | (11) £16. 6. 7½. | (12) £6. 18. 11¼. |

## SIMPLE PROPORTION.

- |                                    |                     |                  |            |
|------------------------------------|---------------------|------------------|------------|
| (1) 6.                             | (2) 7½.             | (3) 9½.          | (4) 20.    |
| (5) 10½.                           | (6) 24.             | (7) 36.          | (8) 4.     |
| (9) 6.                             | (10) 9½.            | (11) 258.        | (12) 28½.  |
| (13) 10.                           | (14) 509¼.          | (15) 1¼½.        | (16) 57.   |
| (17) 14¾.                          | (18) 42¼.           | (19) 41¼.        | (20) 69.   |
| (21) 17.                           | (22) 30.            | (23) 22½.        | (24) 153.  |
| (25) 12¼.                          | (26) 8¼.            | (27) 22.         | (28) 14¾.  |
| (29) 18¾.                          | (30) 36.            | (31) 5·15.       | (32) ·017. |
| (33) ·6892 nearly.                 | (34) 11·856 nearly. | (35) 26·208.     |            |
| (36) £11. 13. 4.                   | (37) £18. 9. 7¾.    | (38) £19. 9. 0¼. |            |
| (39) 17s. 0¾d.                     | (40) £5. 10. 3¼.    | (41) 619 miles.  |            |
| (42) 126 tons.                     | (43) 10 tons 9 cwt. |                  |            |
| (44) 11 tons 15 cwt. 2 qrs.        | (45) £11. 18. 5¼.   | (46) £45. 14. 0. |            |
| (47) 28 tons 11 cwt. 1 qr. 20 lbs. |                     | (48) £23. 1. 4¼. |            |
| (49) £3700. 10. 6.                 | (50) £40. 10. 0.    | (51) 900 days.   |            |
| (52) 156 men.                      | (53) 8400 acres.    | (54) 8s. 9d.     |            |
| (55) £423. 5. 0.                   | (56) £1. 2. 8.      | (57) £1. 7. 6.   |            |

- (53) £1. 0. 11 $\frac{3}{4}$ . (59) £43. 10. 2 $\frac{1}{4}$ . (60) 46 tons 10 cwt.  
 (61) £3. 2. 0. (62) £587. 13. 0. (63) 10s. 9 $\frac{3}{8}$ d.  
 (64) £17. 7. 1. (65) 16 hrs. 40 min. (66) £1. 9. 8 $\frac{5}{8}$  $\frac{2}{3}$ d.  
 (67) £3. 14. 4 $\frac{1}{2}$ . (68) £1. 3. 4. (69) £662. 8. 0.  
 (70) £3606. 4. 0. (71) £5. 5. 0. (72) 13 cwt.  
 (73) 2s. 7 $\frac{1}{2}$ d. (74) £10. 10. 4 $\frac{1}{2}$ . (75) £52. 19. 6.  
 (76) £5. 12. 3 $\frac{1}{2}$ . (77) £1. 10. 0.  
 (78) 140 hrs. 37 $\frac{1}{2}$  min. (79) 21 days. (80) £140.  
 (81) 16s. 5 $\frac{2}{5}$ d. (82) 7 $\frac{1}{4}$ d. (83) 50 tons.  
 (84) 49 days. (85) 1 hr. 6 m. 11 $\frac{1}{2}$  sec. (86) 14s. 2d.  
 (87) 7 cwt. 3 qrs. 15 $\frac{7}{8}$  lbs. (88) 7s. 3 $\frac{3}{4}$ d. (89) 80 dozen.  
 (90) £9. 17. 5. (91) £9. 13. 4 $\frac{1}{2}$ . (92) 6 $\frac{3}{4}$ d.  
 (93) 11s. 10d. (94) £54. 16. 4. (95) £14. 2. 8 $\frac{1}{2}$ d.  
 (96) 22 qrs. 5 bus. 1 pk. (97) £6. 6. 0. (98) £117. 15. 2 $\frac{1}{2}$  $\frac{2}{3}$ d.  
 (99) £527. 6. 8. (100) 240 yards. (101) £2. 11. 3.  
 (102) £42. 0. 0. (103) 45 miles. (104) £13. 18. 9.  
 (105) 6 $\frac{3}{4}$  bushels. (106) 30 yards. (107) 2 days.  
 (108) 10 hours. (109) £75. 11. 3. (110) £12. 15. 7 $\frac{3}{4}$ d.  
 (111) 77 qrs. 1 pk. (112) £109. 13. 4. (113) £189. 0. 0.  
 (114) 4s. 1 $\frac{1}{2}$ d. (115) 6s. 9d.  
 (116) £2. 1. 3 $\frac{3}{4}$  nearly. (117) 1 day. (118) 76 men.  
 (119) 29 ounces. (120) £7000. (121) £17. 6. 10 $\frac{1}{2}$ d.  
 (122) 10d. (123) £16. 15. 4. (124) 1s. 4d.  
 (125) £10. (126) £8. (127) 12 cwt. 4 lbs. 5 oz.  
 (128) 2 tons 17 cwt. 1 qr. 5 lbs. 8 $\frac{4}{5}$ 375 oz. (129) 58 tons 17 cwt. 3 $\frac{1}{2}$  lbs.  
 (130) 2s. 4 $\frac{1}{8}$  $\frac{8}{9}$ d. (131) £35. 9. 4. (132) 117<sup>th</sup> page.  
 (133) 9s. 7 $\frac{2}{3}$  $\frac{2}{3}$ d. and £258. 10. 0. (134) 3 $\frac{3}{4}$  dozen.  
 (135) £25. 15. 3. (136) £3. 10. 11 $\frac{2}{3}$  $\frac{5}{6}$ d. (137) 35 and 56.  
 (138) £42. 10. 0. (139) £13. 6. 8.  
 (140) 19 hrs. 41 m. 42 sec. (141) 1 h. 13 min.  
 (142) £575. 15. 2. (143) 9 hours.  
 (144) In 30 hrs. from B's start when both have walked 120 miles.  
 (145) 159 days. (146) £17. 7. 2 $\frac{3}{4}$ . (147) £154. 14. 0 $\frac{3}{4}$ d.  
 (148) £4. 3. 5 $\frac{1}{4}$ . (149) £588. 0. 0. (150) £87. 3. 0.  
 (151) 3 $\frac{1}{2}$  lbs.  
 (152) Water 82 cwt. 4368 lbs., sugar 2 cwt. 3 qrs. 14784 lbs., starch  
 3 cwt. 2 qrs. 0784 lbs.  
 (153) 858750. (154) £33. 17. 6. (155) £570. 8. 6 $\frac{1}{2}$ d.  
 (156) 2 $\frac{1}{4}$  days. (157) 339, 226 and 113.  
 (158) 3 lbs. 6 $\frac{1}{8}$  oz. and 2 lbs. 10 $\frac{1}{2}$  oz. (159) 132 hours.  
 (160) £1. 13. 8 $\frac{1}{4}$ . (161) £88. 14. 7 $\frac{1}{2}$ . (162) £18. 0. 7 $\frac{1}{2}$ d.

- |                                       |                                     |                                 |
|---------------------------------------|-------------------------------------|---------------------------------|
| (133) 4 lbs. $7\frac{1}{3}$ oz.       | (164) £1.                           | (165) 178·855 miles.            |
| (166) 240000 miles.                   | (167) £161. 14. 0.                  | (168) 150·89, &c. versts.       |
| (169) £10. 4. 9.                      | (170) £17. 12. 0.                   | (171) £24. 10. 0.               |
| (172) £732.                           | (173) £7585. 13. 0 son;             | £2528. 11. 0 daughter.          |
| (174) 7 lbs. 13 oz.                   | (175) 7 miles.                      | (176) 22 days.                  |
| (177) 220 strokes.                    | (178) £3. 8. 3.                     |                                 |
| (179) £1091. 13. 1·9 nearly.          | (180) £157. 10. 0.                  |                                 |
| (181) £142. 3. 9.                     | (182) 36 yds.; £10. 2. 6.           | (183) £18949315 $\frac{5}{3}$ . |
| (184) £1576 $\frac{5}{7}$ .           | (185) 37 $\frac{1}{2}$ yards.       | (186) 1132 $\frac{7}{2}$ miles. |
| (187) £176. 17. 6.                    | (188) 20 $\frac{1}{2}$ tons.        | (189) £11. 13. 4.               |
| (190) £10. 5. 7 $\frac{1}{2}$ .       | (191) £1734. 14. 9.                 | (192) 36 hours.                 |
| (193) 45 yards.                       | (194) 5 days.                       | (195) 7 hours.                  |
| (196) 34 men.                         | (197) 22 wks. 5 $\frac{3}{5}$ days. |                                 |
| (198) 221472 blocks; £2768. 8. 0.     | (199) 36 reams 9 quires 4 sheets.   |                                 |
| (200) £763. 17. 6.; 2s. 1d. in the £. |                                     |                                 |

## COMPOUND PROPORTION.

- |                                  |                                     |                                |
|----------------------------------|-------------------------------------|--------------------------------|
| (1) 216 men.                     | (2) 70 horses.                      | (3) £34. 2. 6.                 |
| (4) £18. 9. 0.                   | (5) £3. 3. 0.                       | (6) 3s. 4d.                    |
| (7) £210.                        | (8) £1. 6. 8.                       | (9) £5. 5. 5.                  |
| (10) 3 cwt. 1 $\frac{1}{3}$ qrs. | (11) 14 lbs. 2 $\frac{5}{6}$ oz.    | (12) 130 yds. 2 ft.            |
| (13) £8. 12. 5.                  | (14) 45 days.                       | (15) 21 $\frac{1}{2}$ cwt.     |
| (16) 172 $\frac{4}{5}$ cwt.      | (17) 131 lbs. 13 oz. 6 drs.         | (18) £36.                      |
| (19) 6 shillings.                | (20) £945.                          | (21) 14s. 8 $\frac{3}{4}$ d.   |
| (22) 30 guineas.                 | (23) 5 $\frac{2}{5}$ weeks.         | (24) 110 ounces.               |
| (25) 6 cwt. 2 qrs. 17 lbs.       | (26) 8 $\frac{1}{10}$ years.        | (27) 16 $\frac{1}{4}$ bushels. |
| (28) 13s. 4d.                    | (29) 111 miles.                     | (30) 10s. 6d.                  |
| (31) £10. 7. 0.                  | (32) 723 $\frac{1}{3}$ bushels.     | (33) £1000.                    |
| (34) 9 hours.                    | (35) 19 $\frac{3}{5}$ days.         | (36) £595. 2. 8.               |
| (37) £3. 12. 11.                 | (38) 6 days.                        | (39) 16 $\frac{3}{8}$ days.    |
| (40) 7 days.                     | (41) 10 days.                       | (42) £32.                      |
| (43) 5 $\frac{1}{3}$ months.     | (44) £206. 13. 4.                   | (45) 718 tons 4 cwt.           |
| (46) £86. 8. 0.                  | (47) £5. 4. 5 $\frac{1}{2}$ .       | (48) 120 days.                 |
| (49) 5 lbs.                      | (50) 160.                           | (51) $\frac{3}{2}$ days.       |
| (52) 40000 men.                  | (53) 36 days.                       | (54) 15 days.                  |
| (55) £3266. 13. 4.               | (56) 1 lb. 13 $\frac{1}{8}$ oz.     | (57) 6 $\frac{3}{8}$ days.     |
| (58) 2 $\frac{3}{5}$ months.     | (59) 8 men.                         | (60) 20 men.                   |
| (61) 72 lbs.                     | (62) As 9 : 25, 3 : 5, and 21 : 25. | (63) £2. 6. 8.                 |

## PER-CENTAGES.

- |                  |                                |                                |
|------------------|--------------------------------|--------------------------------|
| (1) 10 per cent. | (2) 16 $\frac{2}{3}$ per cent. | (3) 12 $\frac{1}{2}$ per cent. |
| (4) £4. 10. 0.   | (5) 12 $\frac{1}{2}$ per cent. | (6) £4. 6. 7 $\frac{1}{2}$ .   |

- |  |                               |  |
|--|-------------------------------|--|
| (7) 7s. 7 $\frac{1}{8}$ d.                                 | (8) 10s. 5d.                  | (9) 9s. 7d.                                |
| (10) £8. 5. 0.   | (11) £2. 9. 6.                |  |
| (12) £2. 12. 6. total gain; 6 $\frac{1}{4}$ gain per cent. |                               | (13) 23 $\frac{1}{3}$ .                    |
| (14) 10d.  | (15) 10s. 10 $\frac{1}{2}$ d. | (16) £8. 7. 3.                             |
| (17) 6s. 8d.   | (18) 50 per cent.             | (19) 9s. 5 $\frac{1}{3}$ d.                |
| (20) 14 $\frac{1}{8}$ d.                                   | (21) £1. 5. 0.                | (22) £5.                                   |
| (23) 8 $\frac{1}{4}$ d.                                    | (24) £10.                     | (25) 66 $\frac{2}{3}$ per cent.            |
| (26) 10 per cent.  | (27) £3. 10. 0.               | (28) 11s. 2 $\frac{1}{4}$ d.               |
| (29) £19. 11. 1.   | (30) £2531. 5. 0.             | (31) £12837. 10. 0.                        |
| (32) £41. 13. 7 $\frac{1}{2}$ .                            | (33) 13s. 2 $\frac{1}{4}$ d.  | (34) £5253. 6. 8.                          |
| (35) £46. 16. 0 $\frac{3}{4}$ .                            | (36) £19. 15. 0.              | (37) £15. 6. 7.                            |
| (38) £308. 0. 9 $\frac{3}{8}$ .                            | (39) £10005.                  | (40) £2. 10. 7 $\frac{1}{2}$ .             |
| (41) £7. 12. 1.  | (42) 17 $\frac{1}{2}$ .       | (43) 87 $\frac{1}{2}$ per cent.; £1. 1. 0. |
| (44) £350.   | (45) £2. 7. 6 $\frac{1}{2}$ . | (46) £28. 1. 0.                            |
| (47) 17s. 10 $\frac{3}{4}$ d.                              | (48) £382.                    | (49) £7. 16. 8.                            |
| (50) £262. 10. 0.  |                               |  |

## SIMPLE INTEREST.

- |                                   |                                   |                                   |
|-----------------------------------|-----------------------------------|-----------------------------------|
| (1) £24.                          | (2) £37. 10. 0.                   | (3) £28.                          |
| (4) £62. 8. 0.                    | (5) £23. 8. 0.                    | (6) £230.                         |
| (7) £115.                         | (8) £23. 8. 0.                    | (9) £83. 2. 6.                    |
| (10) £75. 0. 9.                   | (11) £516.                        | (12) £80. 18. 11 $\frac{1}{10}$ . |
| (13) £81. 14. 0.                  | (14) £460. 9. 0.                  | (15) £2. 7. 6 $\frac{1}{2}$ .     |
| (16) £205. 11. 1 $\frac{1}{10}$ . | (17) £157. 9. 6 $\frac{3}{4}$ .   | (18) £93. 7. 6.                   |
| (19) £15. 5. 3 $\frac{1}{2}$ .    | (20) £624. 15. 0.                 | (21) £34. 19. 0 $\frac{3}{4}$ .   |
| (22) £183. 6. 8.                  | (23) £7946. 18. 6 $\frac{1}{2}$ . | (24) £930. 15. 0.                 |
| (25) £216. 17. 2 $\frac{1}{10}$ . | (26) £518. 2. 1 $\frac{3}{4}$ .   | (27) £56. 2. 5 $\frac{1}{10}$ .   |
| (28) £18. 6. 10.                  | (29) £92. 12. 11 $\frac{1}{2}$ .  | (30) £109. 5. 0.                  |
| (31) £526. 15. 0.                 | (32) £140. 14. 0.                 | (33) £175. 10. 0.                 |
| (34) 22 $\frac{2}{5}$ years.      | (35) £12. 13. 5 $\frac{1}{5}$ .   | (36) £512. 15. 1 $\frac{1}{2}$ .  |
| (37) £300. 14. 8 $\frac{2}{5}$ .  | (38) 3 $\frac{1}{2}$ years.       | (39) 5 per cent.                  |
| (40) 3 $\frac{1}{5}$ per cent.    | (41) £98. 14. 3 $\frac{1}{4}$ .   | (42) £500.                        |
| (43) £761. 18. 1 $\frac{1}{4}$ .  | (44) £10. 14. 9 $\frac{1}{3}$ .   | (45) £354. 17. 3 $\frac{1}{3}$ .  |
| (46) £400.                        | (47) £1. 11. 8 $\frac{1}{4}$ .    | (48) 2 $\frac{1}{3}$ years.       |
| (49) 40 years.                    | (50) 3 years.                     | (51) 7 $\frac{1}{3}$ per cent.    |
| (52) £226. 1. 0.                  | (53) £1100.                       | (54) 6 $\frac{1}{4}$ years.       |
| (55) 1 per cent.                  | (56) £15. 10. 0 $\frac{3}{8}$ .   | (57) £143. 16. 5 $\frac{1}{3}$ .  |
| (58) £2. 3. 1 $\frac{1}{2}$ .     | (59) £323. 7. 11 $\frac{2}{3}$ .  | (60) £11350. 10. 0.               |
| (61) £33. 9. 7 $\frac{5}{8}$ .    | (62) 5 per cent.                  | (63) £324. 5. 1.                  |
| (64) 10 years.                    | (65) £26. 0. 10.                  |                                   |



## COMPOUND INTEREST.

- |                                     |                                    |                                   |
|-------------------------------------|------------------------------------|-----------------------------------|
| (1) £24. 7. 2 $\frac{1}{2}$ .       | (2) £60. 17. 7 $\frac{1}{2}$ .     | (3) £144. 18. 4 $\frac{1}{2}$ .   |
| (4) £255. 16. 8 $\frac{1}{2}$ .     | (5) £191. 0. 7 $\frac{1}{2}$ .     | (6) £731. 4. 3 $\frac{1}{2}$ .    |
| (7) £153. 10. 8 $\frac{1}{2}$ .     | (8) £1702. 8. 6 $\frac{3}{4}$ .    | (9) £1706. 15. 4 $\frac{3}{4}$ .  |
| (10) £18822. 19. 11 $\frac{3}{4}$ . | (11) £57469. 10. 3 $\frac{3}{4}$ . | (12) £1239. 18. 2 $\frac{1}{4}$ . |
| (13) £444. 4. 5 $\frac{1}{4}$ .     | (14) £1862. 4. 7 $\frac{3}{4}$ .   | (15) £7205. 5. 3 $\frac{1}{4}$ .  |
| (16) £206847. 18. 5 $\frac{3}{4}$ . | (17) £191. 5. 0 $\frac{1}{4}$ .    | (18) £830. 10. 8.                 |
| (19) £1972. 5. 2 $\frac{1}{4}$ .    | (20) £3702. 6. 0.                  | (21) £401. 17. 0 $\frac{1}{2}$ .  |
| (22) £1000.                         | (23) £946. 17. 9.                  | (24) 4s. 9 $\frac{3}{4}$ d.       |
| (25) 6 per cent.                    | (26) £48. 14. 11.                  | (27) £167. 6. 2 $\frac{1}{2}$ .   |
| (28) £109. 10. 2.                   | (29) £5887. 6. 8 $\frac{3}{4}$ .   | (30) £69. 11. 3 $\frac{1}{4}$ .   |
| (31) 3 years.                       | (32) £10000.                       |                                   |

## DISCOUNT.

- |   |  |                                |
|---|--|--------------------------------|
| (1) £3710.                                    | (2) £497. 4. 0.                        | (3) £1103.                     |
| (4) £721. 5. 0.                               | (5) £1600.                             | (6) £408.                      |
| (7) £315.                                     | (8) £80. 13. 4.                        | (9) £28. 4. 0.                 |
| (10) £326. 0. 5 $\frac{3}{8}$ $\frac{5}{7}$ . | (11) 8s. 1 $\frac{1}{2}$ d.            | (12) £11. 1. 0.                |
| (13) £9.                                      | (14) £1. 12. 0.                        | (15) £17. 12. 0.               |
| (16) £18. 12. 0.                              | (17) £1. 0. 1 $\frac{3}{4}$ .          | (18) £1. 17. 2 $\frac{1}{5}$ . |
| (19) £2. 6. 9 $\frac{3}{8}$ .                 | (20) £13. 11. 10 $\frac{3}{8}$ nearly. | (21) £3. 8. 0.                 |
| (22) 8s. 3d.                                  | (23) £3. 9. 4.                         | (24) 16s. 3d.                  |
| (25) £60. 8. 3.                               | (26) £1. 2. 6.                         | (27) £1. 5. 0.                 |
| (28) £4. 14. 1 $\frac{4}{5}$ $\frac{7}{10}$ . | (29) £5. 8. 0.                         | (30) 2s. 7 $\frac{1}{2}$ d.    |

## STOCKS.

- |                                     |                   |                                   |
|-------------------------------------|-------------------|-----------------------------------|
| (1) £4600.                          | (2) £123. 3. 0.   | (3) £3. 13. 8 $\frac{4}{16}$ .    |
| (4) In the 4 per cents.             | (5) £5. 8. 0.     | (6) £23. 8. 9.                    |
| (7) £90000.                         | (8) £38. 10. 0.   | (9) £50 increase.                 |
| (10) £200 increase.                 | (11) £81. 5. 0.   | (12) £8099.                       |
| (13) £30 increase.                  | (14) £676. 16. 0. | (15) £281. 18. 11 $\frac{3}{4}$ . |
| (16) The 3 $\frac{1}{2}$ per cents. | (17) £1760.       | (18) £240. 2. 0.                  |
| (19) £16. 10. 0 increase.           |                   | (20) £5950.                       |

## PROPORTIONAL PARTS.

- |  |  |
|--|--|
| (1) 369, 246, 123.                           | (2) 144, 90, 126, 180.                         |
| (3) 8 $\frac{2}{3}$ , 26, 17 $\frac{1}{3}$ . | (4) 111, 11·1, 1·11.                           |
| (5) 7 lbs. 11 dwts. 6 grs.                   | (6) 48 and 45.                                 |
| (7) 14, 49, 63; 63, 42, 21.                  | (8) 24 lbs. 9 oz.; £1264. 7. 9 $\frac{3}{4}$ . |

- (9) Potash 3 cwt., Ph. L. 6 cwt. 1 qr. 16 lbs. 12·8 oz., Ch. P. 3 lbs. 9·344 oz., E. Ph. 8 cwt. 3 qrs. 16 lbs. 12·8 oz., S. 11 lbs. 3·2 oz., M. O. 5 lbs. 9·6 oz.; Loss 1 cwt. 2 qrs. 2 lbs. 0·256 oz.
- (10) 324, 320. (11)  $291\frac{3}{4}$ ,  $233\frac{3}{4}$ ,  $194\frac{3}{4}$ .
- (12) Ch. S. 1 ton 6 cwt. 2 qrs., S. S. 4 cwt. 2 qrs. 11·2 lbs., Ch. M. 5 cwt. 0 qrs. 11·2 lbs.
- (13) £60, £100, £160, £200. (14) 8 oz. 6 dwts. 16 grs.
- (15) £45 notes, £30 gold, £10 silver.
- (16) W. 14 lbs. 8·96 oz., F. F. 15 lbs. 7·296 oz., H. G. 2 qrs. 24 lbs. 1·23 oz., M. 1 lb. 14·464 oz.
- (17) A £30; B £10; C £3. 6. 8; D £16. 13. 4.
- (18) 1071, 1197, 1449. (19)  $30\frac{1}{2}$  and  $71\frac{1}{2}$ .
- (20) £77. 15.  $6\frac{2}{3}$ ; £155. 11.  $1\frac{1}{3}$  and £466. 13. 4.
- (21) £1. 15. 10; £25. 4. 3; £9. 19.  $2\frac{1}{2}$ ; £14. 12.  $4\frac{1}{2}$ . (22) 97 : 83.
- (23) A £63; B £157. 10. 0; C £178. 10. 0. (24) A £396; B £297.
- (25) £71. 8.  $6\frac{2}{3}$ ; £28. 11.  $5\frac{1}{4}$ .
- (26) A £3500; B £1000; and C and D £1250 each.
- (27) £6015. 16.  $6\frac{1}{4}$ ; £3609. 9.  $11\frac{1}{4}$ ; £2807. 7.  $8\frac{3}{4}$ ; £3208. 8. 10; £1203. 3.  $3\frac{3}{4}$ ; £4411. 12.  $1\frac{3}{4}$ ; £2005. 5.  $6\frac{1}{4}$ .
- (28) A £540; B £972; C £810 and D £1158. (29) £4.
- (30) 63, 27, 42, and 57 respectively.
- (31) 169 tons iron, 156 tons grain, and 25 tons provisions.
- (32) Wages £275280; permanent way £165168; rolling stock £229100; material £155992; duty, &c. £91760.
- (33) A £60, B £245, C £405.

## INVOLUTION.

- |  |                                     |  |
|--|-------------------------------------|--|
| (1) 29791.                                 | (2) 855625.                         | (3) 43237380096.                                   |
| (4) 31255·875.                             | (5) 1·442897.                       | (6) 801·506204569.                                 |
| (7) 17596287801.                           | (8) 118587876497.                   | (9) 78310985281.                                   |
| (10) 1015·075125.                          | (11) 781.                           | (12) 177266.                                       |
| (13) 137142080.                            | (14) ·035012791.                    | (15) 92100·25.                                     |
| (16) 100875809.                            | (17) 525.                           | (18) 124618464.                                    |
| (19) 168210432.                            | (20) 246949969867776.               | (21) 38385223.                                     |
| (22) 247278197870.                         | (23) $1580\frac{1191}{10880}$ .     | (24) 14·885593.                                    |
| (25) ·01, &c.                              | (26) 20275550.                      | (27) 53·841087.                                    |
| (28) ·118955463.                           | (29) 1543·1151898784.               | (30) 355999·6, &c.                                 |
| (31) $\frac{289}{1500}$ or $\frac{1}{4}$ . | (32) $\frac{583}{680}$ .            | (33) $\frac{312}{770}$ .                           |
| (34) $\frac{21127569}{35768121}$ .         | (35) $\frac{10385159}{213347167}$ . | (36) $\frac{60025}{2401}$ or $21\frac{204}{401}$ . |

## EVOLUTION.

(1) 616.	(2) 526.	(3) 723.	(4) 816.
(5) 476.	(6) 593.	(7) 874.	(8) 518.
(9) 307.	(10) 1001.	(11) 1·03.	(12) 12·6.
(13) 6·03.	(14) 55·8.	(15) 28·21347.	(16) 28·30194.
(17) 25·25866.	(18) 2·00748.	(19) 1·92093.	(20) 9·02219.
(21) 22·99258.	(22) 10·00822.	(23) 80·3456.	(24) 272.
(25) 37·21.	(26) 15·36845.	(27) 45·08991.	(28) 45·21871.
(29) 5·51356.	(30) 5·15633.	(31) 1·03811.	(32) 12.
(33) 31.	(34) 97.	(35) 38.	(36) 47.
(37) 54.	(38) 168.	(39) 592.	(40) 732.
(41) 4·17933.	(42) 9·87169.	(43) 4·76220.	(44) 6·78242.
(45) 9·81665.	(46) 9·33319.	(47) 8·40611.	(48) 8·98350.
(49) 3·07231.	(50) 3·36197.	(51) 4·8202.	(52) 6·42468.
(53) 1·69015.	(54) 3·26417.	(55) 0·00859.	(56) 0·0504.
(57) $\frac{5}{6}$ .	(58) $\frac{9}{15}$ .	(59) $1\frac{1}{3}$ .	(60) $\frac{4}{5}$ .
(61) $\frac{7}{8}$ .	(62) $\frac{4}{5}$ .	(63) $\frac{2}{3}$ .	(64) $1\frac{1}{2}$ .
(65) $\frac{6}{10}$ .	(66) $\frac{8}{13}$ .	(67) $\frac{9}{14}$ .	(68) $1\frac{7}{11}$ .
(69) $\frac{5}{6}$ .	(70) $\frac{3}{4}$ .		

## INVOLUTION AND EVOLUTION.

(1) 539·8 nearly.	(2) 33·926 nearly.	(3) 69·57 yards nearly.	
(4) 14 ac. 4440 sq. yds.	(5) 100544 $\frac{1}{2}$ c. ft.	(6) 2655 c. yds. 3 ft. 1507 $\frac{5}{8}$ in.	
(7) 1728.	(8) 649·5.	(9) 11·20965.	(10) $2\frac{1}{10}$ .
(11) $1\frac{8}{17}$ .	(12) $7\frac{1}{2}$ .	(13) 9100 sq. yds.	
(14) 19·23538.	(15) 27·11088 ft.	(16) 76 inches.	
(17) 582·06 yds. nearly.	(18) 8·48528 ft. nearly.	(19) 1022 sq. ft.	
(20) 768 sq. inches.	(21) 12.	(22) 7.	(23) 63.
(24) 6 and 12.	(25) 10 and 20.	(26) $4\frac{1}{2}$ and $17\frac{1}{2}$ .	
(27) 244 lbs. 11 oz.			

## EXAMINATION PAPERS.

## PAPER I.

- (1) 103; 7609; 40020; 1806; 9407.  
 (2) Seven thousand and twenty one, three hundred and seven, three thousand and nine, eighteen thousand and eighty seven, five thousand and ten.  
 (3) 2283. (4) 429. (5) 95627.  
 (6) Two hundred and one thousand nine hundred and fifty five.  
 (7) Seventy thousand and seventy, seven hundred and seven, five thousand seven hundred and six, nine millions eleven thousand six hundred and ten, three thousand two hundred and ten, ten thousand one hundred and seventy six, and forty thousand four hundred.  
 (8) 152977.  
 (9) One million one hundred and thirty four thousand and seventy.  
 (10) 89655751.

## PAPER II.

- (1) 56. (2) 9115. (3) 960264. (4) 75894084. (5) 6191.  
 (6) Seventy two millions nine hundred and seventy five thousand three hundred and eighty nine.  
 (7) 27789. (8) 2048. (9) 291375. (10) 16741.

## PAPER III.

- (1) 18862. (2) 27 times and 100420 rem<sup>r</sup>. (3) 12804.  
 (4) 155708. (5) 668192. (6) 20736. (7) 7148 days.  
 (8) 35802. (9) 10200 and 915 rem<sup>r</sup>. (10) 1377392794281.

## PAPER IV.

- (1) 2385. (2) 31. (3) 3753 and 11 rem<sup>r</sup>. (4) 708.  
 (5) 11292 farthings. (6) £8. 13. 5 $\frac{3}{4}$ . (7) 210 dozens.  
 (8) 787422. (9) 13s. 9d. (10) £2265. 5. 6.

## PAPER V.

- |                                     |                              |                 |
|-------------------------------------|------------------------------|-----------------|
| (1) 8702 and 119 rem <sup>r</sup> . | (2) £1. 8. 8 $\frac{3}{4}$ . | (3) 72 times.   |
| (4) £7. 17. 6 $\frac{1}{2}$ .       | (5) £1005. 13. 8.            |                 |
| (6) £6865. 11. 10 $\frac{1}{2}$ .   | (7) £7. 5. 10.               | (3) £91. 11. 9. |
| (9) 17s. 7 $\frac{1}{4}$ d.         | (10) 407.                    |                 |

## PAPER VI.

- |                                |                                      |                                |
|--------------------------------|--------------------------------------|--------------------------------|
| (1) £17. 18. 0 $\frac{1}{3}$ . | (2) £1552. 5. 7 $\frac{1}{2}$ .      | (3) £18. 19. 9 $\frac{1}{4}$ . |
| (4) £14. 17. 6.                | (5) 845941 and 66 rem <sup>r</sup> . |                                |
| (6) £2. 13. 5 $\frac{1}{3}$ .  | (7) 40 lbs.                          | (8) £10. 17. 6.                |
| (9) 144.                       | (10) 12s. 4 $\frac{3}{4}$ d.         |                                |

## PAPER VII.

- |  |                               |                 |
|--|-------------------------------|-----------------|
| (1) £1. 3. 0 $\frac{3}{4}$ ; £232. 15. 7 $\frac{1}{2}$ . | (2) £2009. 3. 6.              | (3) £31. 10. 0. |
| (4) 792 $\frac{3}{5}$ yds.                               | (5) 272 days.                 | (6) 20 times.   |
| (8) £60. 18. 9.  | (9) £50. 0. 2 $\frac{1}{2}$ . | (10) £5. 15. 9. |
| (7) 604800 times.  |                               |                 |

## PAPER VIII.

- |                                 |                                      |
|---------------------------------|--------------------------------------|
| (1) £148. 13. 2 $\frac{3}{4}$ . | (2) 1325 m. 6 fur. 2 p. 2 yds. 1 ft. |
| (3) £68. 3. 10 $\frac{1}{2}$ .  | (4) £8. 13. 4.                       |
| (6) £7. 14. 0.                  | (7) 293.                             |
| (9) £41. 11. 2.                 | (10) 3s. 8d.                         |
| (5) £2. 19. 6.                  | (8) 16s. 3 $\frac{1}{2}$ l.          |

## PAPER IX.

- |                                 |                               |                            |
|---------------------------------|-------------------------------|----------------------------|
| (1) 10d.                        | (2) £184. 4. 0.               | (3) 3s. 6d.                |
| (4) £1745. 8. 1 $\frac{1}{2}$ . | (5) £5. 8. 11 $\frac{1}{2}$ . | (6) 4s. 6 $\frac{1}{2}$ d. |
| (7) 400.                        | (8) £60. 15. 0.               | (9) 792.                   |
| (10) 19s. 7 $\frac{1}{2}$ d.    |                               |                            |

## PAPER X.

- |                              |                              |                               |
|------------------------------|------------------------------|-------------------------------|
| (1) 110.                     | (2) £5. 7. 9 $\frac{1}{4}$ . | (3) £4. 6. 10 $\frac{1}{4}$ . |
| (4) 2s. 3d.                  | (5) £9. 6. 8.                | (6) 5s. 6d.                   |
| (7) 17s. 10 $\frac{1}{2}$ d. | (8) 210.                     | (9) 5995 pence.               |
| (10) £88. 4. 0.              |                              |                               |

## PAPER XI.

- |   |                               |                               |
|---|-------------------------------|-------------------------------|
| (1) 18486877 $\frac{1}{3}$ ; 13664213 $\frac{2}{3}$ .       | (2) 174 days.                 |                               |
| (3) £134. 12. 6 $\frac{1}{4}$ ; £156. 19. 1 $\frac{3}{4}$ . | (4) £3. 12. 9 $\frac{1}{4}$ . | (5) 17 weeks.                 |
| (6) 9506 and 7799.  | (7) 47.                       | (8) £2. 1. 11 $\frac{1}{2}$ . |
| (9) 30s. a man, 10s. a woman, 7s. 6d. a boy.                |                               |                               |
| (10) 177 m. 2 f. 18 p. 2 yds.                               |                               |                               |

## PAPER XII.

- |                                |                 |                     |
|--------------------------------|-----------------|---------------------|
| (1) 780.                       | (2) 9s. 9½d.    | (3) 10 dozen pairs. |
| (4) £131. 0. 10.               | (5) £1. 15. 9¾. | (6) £22. 6. 3.      |
| (7) £69. 6. 0.                 | (8) 37 tons.    |                     |
| (9) £362. 0. 5¼; £848. 12. 2½. |                 | (10) £83. 5. 0.     |

## PAPER XIII.

- |                  |                                |                            |
|------------------|--------------------------------|----------------------------|
| (1) 50706.       | (2) 3 m. 1154 yds. 2 ft. 2 in. | (3) 3405.                  |
| (4) £4054. 2. 6. | (5) £15936. 12. 0.             | (6) 853 shillings 2 pence. |
| (7) 1611336.     | (8) 120921025.                 | (9) £2. 16. 7½.            |
| (10) £22. 15. 0. |                                |                            |

## PAPER XIV.

- |                                     |                                 |
|-------------------------------------|---------------------------------|
| (1) 54 tons 10 cwt. 20 lbs.         | (2) 2 tons 1 cwt. 1 qr. 21 lbs. |
| (3) 118 ac. 28 p. 19¼ yds.          | (4) 3294 gallons.               |
| (5) 1456 bus. 2 pks.; £97. 2. 0.    | (6) £6. 11. 11½²⁹.              |
| (7) £385. 12. 9¾; 4611 threepences. | (8) £4. 3. 9¾.                  |
| (9) 12 m. 1630 yds.                 | (10) £767. 5. 0; 1700 cents.    |

## PAPER XV.

- |                                  |                  |                    |
|----------------------------------|------------------|--------------------|
| (1) £2. 2. 5.                    | (2) 15355.       | (3) £346. 10. 10½. |
| (4) £75. 10. 2.                  | (5) £4. 15. 0½.  | (6) 440.           |
| (7) 146 sovs. and 5s. 7½d. remr. |                  | (8) £2953. 9. 10.  |
| (9) £1. 11. 10¼.                 | (10) £15. 0. 0¼. |                    |

## PAPER XVI.

- |                                  |                                    |                   |
|----------------------------------|------------------------------------|-------------------|
| (1) £69. 8. 10¾.                 | (2) 10560 paces.                   | (3) £142. 17. 5¾. |
| (4) £34143. 2. 10.               | (5) 12s. 3d.                       | (6) £35. 13. 9½.  |
| (7) 2 tons 18 cwt. 19 lbs. 8 oz. | (8) 14 tons 2 cwt. 1 qr. 7½²⁹ lbs. |                   |
| (9) £1. 6. 5¼.                   | (10) 3¼d.                          |                   |

## PAPER XVII.

- |                  |                   |                    |
|------------------|-------------------|--------------------|
| (1) £125. 1. 8.  | (2) 4d.           | (3) £75. 17. 6½.   |
| (4) 660.         | (5) 164½ gals.    | (6) £4372. 3. 11½. |
| (7) £47. 10. 8.  | (8) £1032. 5. 9¾. | (9) £1. 4. 7¼.     |
| (10) £19. 2. 6¼. |                   |                    |

## PAPER XVIII.

- |                                      |                 |                     |
|--------------------------------------|-----------------|---------------------|
| (1) 265.                             | (2) 100203.     | (3) 45 times.       |
| (4) £60. 15. 10½.                    | (5) £22. 15. 0. | (6) £4211302. 1. 8. |
| (7) 5292 florins.                    | (8) 3840 yards. | (9) 11½d.           |
| (10) 12276 lbs. 3 oz. 1 dwt. 10 grs. |                 |                     |

## PAPER XIX.

- |                                    |                |                   |
|------------------------------------|----------------|-------------------|
| (1) £7. 15. 7½.                    | (2) 16s. 6d.   | (3) 15.           |
| (4) 13 tons 10 cwt. 2 qrs. 17 lbs. | (5) 60.        | (6) £1133. 15. 0. |
| (7) £3. 8. 3.                      | (8) £10. 2. 0. | (9) £2. 15. 8¾.   |
| (10) £1481. 11. 3.                 |                |                   |

## PAPER XX.

- |                                       |                        |                   |
|---------------------------------------|------------------------|-------------------|
| (1) £73. 17. 7½.                      | (2) £1. 19. 7.         | (3) 287.          |
| (4) £27. 5. 3¼.                       | (5) 2341 and 393 remr. | (6) £7459. 4. 5½. |
| (7) £4. 4. 11½; £23. 7. 3¼.           | (8) 19957 grs.         | (9) 4950 times.   |
| (10) Latter, by 16 cwt. 3 qrs. 7 lbs. |                        |                   |

## PAPER XXI.

- |  |                                   |
|--|-----------------------------------|
| (1) 352.   | (2) 5 tons 16 cwt. 3 qrs. 24 lbs. |
| (3) 127795 tons 4 cwt.   |                                   |
| (4) 84 tons 19 cwt. 2 qrs. 19 lbs. 5 oz.; 48 m. 22 p. 4 yds. 2 ft. 9 in. |                                   |
| (5) 90381567 sq. in. and 90381567 sec.                                   | (6) 1442 qrs. 1 bus. 2 pks.       |
| (7) 1 cwt. 2 qrs. 18¾ lbs.   | (8) 6 cwt. 3 qrs. 12 lbs. 7 oz.   |
| (9) 6 c. yds. 3 ft. 409 in.  | (10) £3. 12. 0.                   |

## PAPER XXII.

- |                              |                           |
|------------------------------|---------------------------|
| (1) 4 m. 106 yds. 2 ft.      | (2) £4. 7. 6½.            |
| (3) 3502035684; 42107871239. | (4) 63 m. 1 f. 2 p. 4 in. |
| (5) 79103817.                | (6) 63918¾ days.          |
| (7) 356842 half-yards.       |                           |
| (8) 18287 yds. 2 qrs.        | (9) £17. 10. 0.           |
|                              | (10) £3431.               |

## PAPER XXIII.

- |                                   |                                 |                    |
|-----------------------------------|---------------------------------|--------------------|
| (1) £3. 6. 0.                     | (2) £20. 10. 7½.                | (3) £1527. 13. 6½. |
| (4) 8253 tons 2 cwt. 9 lbs. 7 oz. | (5) 4061 times, 25302 oz. remr. |                    |
| (6) 17s. 3d.                      | (7) 50 min.                     | (8) 4752 times.    |
| (9) £4. 10. 5.                    | (10) £2. 7. 2¼.                 |                    |

## PAPER XXIV.

- |                 |                  |                         |
|-----------------|------------------|-------------------------|
| (1) 6072 days.  | (2) Wednesday.   | (3) 125 half-pence.     |
| (4) £167. 6. 8. | (5) £161. 12. 6. | (6) 12 yds. 1 ft. 4 in. |
| (7) 261 days.   | (8) £12. 11. 9½. | (9) £3195. 15. 4¼.      |
| (10) 16s. 11½d. |                  |                         |

## PAPER XXV.

- |                      |   |                   |
|----------------------|---|-------------------|
| (1) £845866. 13. 4.  | (2) £1. 12. 0¾.                           | (3) 8936 days.    |
| (4) 1439.            | (5) 123 tons 6 cwt. 23 lbs. 12 oz. 2 drs. |                   |
| (6) 28193 sq. yards. | (7) 240.                                  | (8) £66. 18. 10¾. |
| (9) 588.             | (10) £27276. 3. 0.                        |                   |

## PAPER XXVI.

- (1) 3125 tons. (2) 4s. 2½d. and 37f. remr. (3) £7. 12. 3.  
 (4) 1515 c. yds. 15 ft. 1474 in. (5) £2925. (6) £738. 3. 0.  
 (7) £81. 5. 7½. (8) 77. (9) 10s. 1d. (10) £11. 3. 4.

## PAPER XXVII.

- (1) 30 yds. 1 ft. 8 in.; 200 poles. (2) 77. (3) 21.  
 (4) 1 ac. 3 r. 17 yds. 5 ft. 128 in. (5) £11. 5. 0. (6) 320 acres.  
 (7) £7. 0. 6½. (8) £793. 7. 4½. (9) 4662 guin. 13s.  
 (10) 68 tons 12 cwt. 2 qrs. 21 lbs.

## PAPER XXVIII.

- (1) 1281 lbs. 11 oz. 10 dwts. 10 grs. (2) 3 r. 7 p. 16 yds. 2 ft. 68 in.  
 (3) £29. 10. 11¼. (4) £1400. 9. 0¾. (5) 15s. 4d.  
 (6) £6. 15. 0. (7) 98 men. (8) £25. 16. 5½.  
 (9) 2400 yds. (10) 10.49 a.m.

## PAPER XXIX.

- (1) 12 lbs. 2 oz. 9 dwts. 23 grs. Troy; 10 lbs. Avoir. 319 grs.  
 (2) 253750 grains. (3) 113 lbs. 5 dwts. (4) £32. 9. 8.  
 (5) £18. 11. 10½. (6) 361 yds. (7) 69s. 5¾d.  
 (8) 40 articles. (9) £131. 13. 8½¾. (10) £2. 4. 4½.

## PAPER XXX.

- (1) £110. 16. 8. (2) £328¾. (3) 95 tons 1 cwt. 2 qrs. 8 lbs.  
 (4) 275 tons 19 cwt. 15 lbs. 12 oz. (5) 220972 lds. 3 qrs. 1 pk.  
 (6) £1710. (7) 3s. 10¾d. (8) £8566. 10. 0.  
 (9) 15758 tons 3 qrs. 12 lbs. 11 oz. (10) 22 times and 3s. 11d. rem.

## PAPER XXXI.

- (1) £140000. (2) 1116 m. 7 p. 2 yds. 1 ft. 4 in.  
 (3) £45208. 6. 8. (4) £1303. 18. 9. (5) 15 times.  
 (6) £12653. 3. 9. (7) 535 days. (8) 156156957889.  
 (9) 3 tons 4 cwt. 1 qr. 9 lbs. (10) £246.

## PAPER XXXII.

- (1) 12276 lbs. 3 oz. 1 sc. 14 grs. (2) 155 yards. (3) £157. 10. 0.  
 (4) 3 sq. m. 352 ac. 2 r. 36 p. 11 yds.  
 (5) Horse £46. 13. 4; carriage £37. 6. 8. (6) 12800.  
 (7) £26. 19. 6⅞. (8) £509. 4. 0. (9) £6675.  
 (10) 48 yards.



## PAPER XXXIII.

- |                                    |                    |
|------------------------------------|--------------------|
| (1) 151 m. 4 f. 23 p. 3 yds. 9 in. | (2) 1s. 1½d.       |
| (3) £4. 12. 0.                     | (4) 2¼ days.       |
| (6) 155 yards.                     | (7) £98541. 13. 4. |
| (9) £2. 15. 6.                     | (8) 40 pairs.      |
| (10) £164. 13. 5.                  |                    |

## PAPER XXXIV.

- |                            |                 |                      |
|----------------------------|-----------------|----------------------|
| (1) 271 tons 14 cwt.       | (2) £107. 8. 0. | (3) £756. 8. 9.      |
| (4) 30 days.               | (5) £707.       | (6) £20000.          |
| (7) 128 tons 8 cwt. 2 qrs. |                 | (8) A, 18s.; B, 12s. |
| (9) 27 tons 9 cwt. 12 lbs. |                 | (10) £120. 2. 1.     |

## PAPER XXXV.

- |  |                 |
|--|-----------------|
| (1) £5. 0. 3½.                           | (2) £3. 17. 2¾. |
| (3) 25 ac. 1 r. 8 p. 11 yds. 2 ft.       | (4) 96.         |
| (5) £40. 6. 2 each man; £20. 3. 1 a boy. | (6) 30 times.   |
| (7) £18. 10. 6.                          | (8) 11s. 10½d.  |
| (10) 1s. 8d.                             | (9) 29 steps.   |

## PAPER XXXVI.

- |                   |   |
|-------------------|---|
| (1) £16. 13. 6½.  | (2) 11 ac. 1 r. 3 p. 20 yds. 3 ft. 70 in. |
| (3) £1. 6. 11¾.   | (4) 10 lbs.                               |
| (6) 8¼d. and 9¾d. | (5) 14 cwt. 2 qrs. 11 lbs.                |
| (9) £337. 19. 4½. | (7) £1. 15. 1.                            |
|                   | (8) 316810 c. ft.                         |
|                   | (10) 2751 tons 2 qrs. 21 lbs. 13 oz.      |

## PAPER XXXVII.

- |                              |                |                                      |
|------------------------------|----------------|--------------------------------------|
| (1) £21. 18. 6¾.             | (2) 79 acres.  | (3) £1329. 6. 9¾.                    |
| (4) 8 c. yds. 9 ft. 1251 in. | (5) £1. 2. 0.  | (6) £9. 5. 3.                        |
| (7) 29 ac. 3 r. 10 p.        | (8) 97⅓ miles. | (9) 5 tons 3 cwt. 1 qr. 4 lbs. 3 oz. |
| (10) 3 yds. 2 in.            |                |                                      |

## PAPER XXXVIII.

- |                                  |            |                                  |
|----------------------------------|------------|----------------------------------|
| (1) 3s. 3¼d.                     | (2) 140.   | (3) 195800 yards; 54450 sq. yds. |
| (4) 2 yrs. 88 dys. 10 h. 34 sec. | (5) 12322. | (6) 75 miles.                    |
| (7) £26. 12. 10½.                | (8) £630.  | (9) 11¾.                         |
| (10) £14. 8. 0.                  |            |                                  |

## PAPER XXXIX.

- |                   |                  |                    |             |
|-------------------|------------------|--------------------|-------------|
| (1) 2 men.        | (2) 9s. 2¼d.     | (3) 2¾d.           | (4) 1s. 6d. |
| (5) 12 yards.     | (6) £2815. 0. 9. | (7) 11730 persons. |             |
| (8) £146. 15. 9¾. | (9) £98. 15. 0.  | (10) £1. 4. 0.     |             |

## PAPER XL.

- (1) £1. 13. 10 $\frac{7}{11}$ . (2) £17. 17. 2 $\frac{1}{4}$ ; £5. 19. 0 $\frac{1}{4}$ . (3) 14s. 0 $\frac{3}{4}$ d.  
 (4) 12 times. (5) 1·94. (6) ·4583. (7) 15s. 8 $\frac{1}{3}$ d.  
 (8) 1 $\frac{1}{2}$  m. from T. in  $\frac{1}{2}$  hr. (9) 3000071. (10) ·2 tons 10 cwt.

## PAPER XLI.

- (1) £47. 7. 11. (2) £17. 15. 0 $\frac{3}{4}$ . (3) £6. 9. 1 $\frac{1}{5}$ .  
 (4) £150. 15. 2 $\frac{1}{4}$ . (5) 9 qrs. 4 bus. 3 pks.; £19. 3. 9. (6) ·5532407.  
 (7) £143. 1. 11 $\frac{3}{4}$ . (8) £70. 6. 0. (9) £2. 1. 3. and £1. 8. 9.  
 (10) £2. 4. 4 $\frac{1}{2}$ .

## PAPER XLII.

- (1) £31955. 4. 4 $\frac{1}{4}$ . (2) £77. 18. 11 $\frac{7}{15}$ . (3) 16 yards.  
 (4) 5 cwt. 2 qrs. 9 lbs. (5) £200. (6) 17233 tons 6 $\frac{2}{3}$  cwt.  
 (7)  $\frac{1}{2}$ . (8) 14 $\frac{611}{3465}$ . (9) 1104780.  
 (10) 162 ac. 3 r. 6 p. 1 yd. 3 $\frac{1}{2}$  ft.; 151 c. yds. 26 ft. 1052 in.

## PAPER XLIII.

- (1) 6 days. (2) 11s. (3) 69984. (4) 35 $\frac{5}{6}$  yards.  
 (5) £10. 4. 5 $\frac{1}{2}$ . (6) £1. 13. 4. (7) 3 yards. (8) ·0·3.  
 (9) A, 8s. 4d.; B, 7s. 6d. (10) 333 men.

## PAPER XLIV.

- (1) £2. 18. 9. (2) £1. 15. 10 $\frac{1}{2}$ . (3) £42. 2. 1 $\frac{1}{5}$ .  
 (4) 2 r. 8 p. 7 yds. 1 ft. 32 in. (5) 18s. 2d. (6) 16.  
 (7) £396. 10. 1 $\frac{1}{2}$ . £7348. 4. 6 $\frac{3}{4}$ . £5817. 1. 3 $\frac{1}{4}$ . £5528. 2. 4 $\frac{1}{2}$ . £4508. 16. 7 $\frac{1}{2}$ .  
 (8) £2. 8. 3 $\frac{3}{5}$ . (9) £3. 16. 3. (10) ·0855.

## PAPER XLV.

- (1) £940. 2. 0. (2) £3. 8. 3. (3) £3. 11. 9 $\frac{1}{4}$ .  
 (4) 7 $\frac{1}{2}$  $\frac{1}{8}$  days. (5) £35. 18. 1 $\frac{1}{2}$ . (6) 257 ac. 1 r. 16 p. 18 yds. 2 ft.  
 (7) £140. 16. 5 $\frac{1}{4}$ . (8) 1 ton 2 cwt. 1 qr. 13·28 lbs. (9) 12s. 6d.  
 (10) Deal, £71. 14. 3 $\frac{1}{4}$ ; walnut, £461. 19. 7 $\frac{1}{2}$ ; hickory, £95. 17. 6;  
 mahogany, £43. 12. 1; baywood, £62. 3. 9; freight, &c.  
 £310. 9. 6; total, £1045. 16. 8 $\frac{3}{4}$ .

## PAPER XLVI.

- (1) 1 m. 1142 yds. 1 $\frac{3}{4}$  ft. (2) £400. 15. 1 $\frac{1}{5}$ . (3) £15. 16. 1 $\frac{7}{10}$ .  
 (4) £11004. 4. 1 $\frac{1}{2}$ . (5) 4 $\frac{1}{2}$ d. (6) £739. 1. 3.  
 (7) 7s. 9d.; £·29375. (8) ·167857142. (9) 4s. 10 $\frac{1}{2}$ d. nearly.  
 (10) £17. 14. 6 $\frac{1}{4}$ .

## PAPER XLVII.

- |                    |                                 |                  |
|--------------------|---------------------------------|------------------|
| (1) £3344. 17. 9½. | (2) £578. 16. 3 nearly.         | (3) 113808.      |
| (4) £21. 5. 0.     | (5) 2846 and 5d. remr.          | (6) £299. 4. 3¾. |
| (7) 6½d.           | (8) 4 tons 19 cwt. 23·0944 lbs. |                  |
| (9) 1·0067, &c.    | (10) £1649. 13. 4.              |                  |

## PAPER XLVIII.

- |                             |                      |                          |
|-----------------------------|----------------------|--------------------------|
| (1) 3s. 3¼d.; £2. 13. 0·84. | (2) 3s. 9¾d.         | (3) £425. 5. 0.          |
| (4) £79625.                 | (5) 43⅞ min. past 2. | (6) 1·026.               |
| (7) £18. 7. 6.              | (8) ⅔, ⅓, 1⅓, 2.     | (9) 10 per cent. gained. |
| (10) 494 yards.             |                      |                          |

## PAPER XLIX.

- |                                    |                    |                 |
|------------------------------------|--------------------|-----------------|
| (1) 86 lbs. 10 oz. 6 dwts. 11 grs. | (2) 2·1175d.       | (3) £4. 19. 0¾. |
| (4) 185 cwts.                      | (5) 9 tons 18 cwt. | (6) £7. 8. 7¼.  |
| (7) 3s. 8⅓⅔⅓d.                     | (8) 1.             | (9) £·57875.    |
| (10) £37. 8. 3·12.                 |                    |                 |

## PAPER L.

- |                      |                       |                               |
|----------------------|-----------------------|-------------------------------|
| (1) £1. 3. 3¾.       | (2) ¼.                | (3) 4 tons 3 qrs. 23·666 lbs. |
| (4) 15 hrs. 28½ min. | (5) £·488 or 9s. 9⅔d. | (6) 1000; £31. 17. 6⅔.        |
| (7) £63. 6. 4½.      | (8) 12 days.          | (9) 1.                        |
|                      |                       | (10) 1½ days.                 |

## PAPER LI.

- |                        |                       |                    |
|------------------------|-----------------------|--------------------|
| (1) ·i42857; ·076923̄. | (2) 28652800 sq. yds. | (3) £4. 7. 10¾.    |
| (4) 178½ miles.        | (5) 7 min. 52⅔ sec.   | (6) £99. 10. 9¾.   |
| (7) 3⅔⅓.               | (8) £2. 9. 2.         | (9) £417. 16. 10¾. |
| (10) £5. 5. 1·41.      |                       |                    |

## PAPER LII.

- |                   |                |                     |
|-------------------|----------------|---------------------|
| (1) 2⅓ hours.     | (2) £2. 13. 4. | (3) 11 yrs. 5 mths. |
| (4) £14. 5. 5⅓.   | (5) £700.      | (6) 14¾.            |
| (7) £254. 15. 9¾. | (8) 7s. 9⅔d.   | (9) £11. 17. 6.     |
| (10) £79. 6. 9⅓⅓. |                |                     |

## PAPER LIII.

- |                             |                     |                       |
|-----------------------------|---------------------|-----------------------|
| (1) £3469. 16. 3.           | (2) 15 m. per hour. | (3) £1. 0. 10.        |
| (4) £26. 10. 8.             | (5) 6⅔d.            | (6) £456. 9. 4½.      |
| (7) ·0588235204117617; ⅔⅔⅔. |                     | (8) 7147 m. 1120 yds. |
| ( ) 1440.                   | (10) £12. 4. 6⅔.    |                       |

## PAPER LIV.

- (1) 69 m. 1 fur. 6 yds. 2 ft.; 1·00041. (2) 2·131534657224 yds.  
 (3) 13 m. 420 yds. (4) £33. 17. 3. (5) 2·0416.  
 (6) £86. 10. 0 $\frac{20}{103}$ . (7) 1 $\frac{25}{63}$ . (8) ·08697  
 (9) 17·77638; 7·50666. (10) 99 ac. 0 r. 4 p.

## PAPER LV.

- (1) A, 15s. 9d.; B, 5s. 3d.; C, 10s. 6d. (2) £3. 18. 7.  
 (3) Oct. 19<sup>th</sup>. 6 p.m. (4) £30 each boy; £45 each man.  
 (5) 1792·01 sq. yds. (6) £2. 1. 3·104.  
 (7) A, 4 m. 2 fur.; B, 3 m. 1 fur. (8) £60.  
 (9) 10s. 5d. (10) £4 per ton.

## PAPER LVI.

- (1) 2 cwt. 1 qr. 11 lbs. 5·2 oz. (2) 84 days. (3) 14 ft. 1·6464 in.  
 (4) 3 $\frac{5}{9}$  years. (5) 160 days. (6) 900 gals.  
 (7) 7 hrs. 20 min. (8) £1. (9) A, 8d.; B, 1s. 4d.; C, 4s.  
 (10) 8s. 6d.

## PAPER LVII.

- (1) £14. 3. 6. (2) £44. 15. 0. (3) 6.  
 (4) 22 $\frac{11}{8}$  hours. (5) 7s. 11 $\frac{5}{101}$ d.  
 (6) 73 $\frac{1}{2}$  m. from P. in 21 hrs. (7) 2 tons 7 cwt. 22 lbs. 1151 grs.  
 (8) 4 $\frac{6141}{10500}$ . (9) £1. 18. 2·7. (10) 30·12625, &c.

## PAPER LVIII.

- (1) £4. (2) 14 men. (3) 1 hr. 57 $\frac{81}{107}$  min.  
 (4) 20·42605. (5) £5. 0. 7 $\frac{1}{4}$  nearly. (6) £3. 14. 1 $\frac{1}{2}$ .  
 (7) 17 cwt. 2 qrs. 3 $\frac{1}{3}$  lbs. (8) 8·034. (9) 5 lbs. 8 oz. 19·2 grs.  
 (10) ·171875.

## PAPER LIX.

- (1) 5 lbs. (2) £1043. 5. 0. (3) £1.  
 (4) £742. 0. 5·55. (5) 75. (6) £646. 2. 0.  
 (7) £5. 16. 1 $\frac{1}{2}$ . (8) £22350. (9) ·61; 1 $\frac{39}{111}$ .  
 (10) 1710.

## PAPER LX.

- (1) 2487·12 c. ft. (2) 134 $\frac{3}{4}$ . (3) 13 m. 210 yds. 1 ft.  
 (4) 141376; 71991236. (5) 6s. 11 $\frac{913}{103}$ d. (6) £158. 18. 0 $\frac{1}{2}$ .  
 (7) £1260. (8) 365·24224. (9) £3079. 3. 5 nearly.  
 (10) £148. 18. 8 $\frac{1}{2}$ .

## PAPER LXI.

- (1)  $3\frac{9}{10}\frac{1}{10}$  years. (2)  $36\frac{3}{4}$  per cent. gain.  
 (3)  $13\frac{1}{8}$  miles per hr. (4) £11. 7.  $6\frac{1}{4}$  nearly.  
 (5) 22 at 3s. 6d.; 28 at 5s. (6) 3·683. (7) 10000.  
 (8) £11. 9.  $10\frac{1}{4}$ . (9) £500. (10) ·01058, &c.

## PAPER LXII.

- (1) £7. 10. 0. (2) £73. 11. 2. (3)  $4\frac{1}{3}$  years.  
 (4) 248 lbs. Av. 5440 grs.; ·6857142. (5)  $254\frac{1}{11}$  kilograms.  
 (6) 1 hr. 6 m. 40 sec. (7) 138 m. 1397 yds. (8) £6. 6. 0.  
 (9) £299. 0.  $4\frac{1}{8}\frac{1}{8}\frac{1}{8}$ . (10) ·428571.

## PAPER LXIII.

- (1) 28 p. 8 sq. yds. 7 ft. 75 in. (2) £115. 18.  $5\frac{1}{2}$  nearly.  
 (3) 13 at 2s. 6d.; 17 at 3s. 6d. (4) 3 years. (5) £25. 3. 0.  
 (6) ·991 2, &c. (7) Lose 4 per cent. (8) 3s.  $5\frac{3}{8}$ d.  
 (9) 9031. (10) 90 miles.

## PAPER LXIV.

- (1)  $27\frac{3}{11}$  min. past 2. (2)  $1\frac{1}{2}\frac{8}{11}\frac{7}{11}$ .  
 (3) Eldest 371 ac. 3 r. 37 p.  $2\frac{3}{4}$  yds.; others 103 ac. 3 r. 16 p. 22 yds. each.  
 (4) 53489 times. (5) 544. (6) 11451 gals. 2 qts.  $1\frac{1}{2}$  pts. nearly.  
 (7) ·0021, &c. (8)  $11\frac{1}{2}$  m. (9) ·53. (10) £115. 5.  $4\frac{1}{2}$ .

## PAPER LXV.

- (1) 57 m. 1467 yds. 2·52 ft. (2) £5100.  
 (3)  $2\frac{2}{5}$ d. 1<sup>st</sup> year, decreasing  $\frac{1}{12}$ d. yearly.  
 (4) 49 yrs. 75 dys. 12 h.  $12\frac{1}{2}$  min. nearly. (5) 621; ·013. (6) 2s. 6d.  
 (7) 2364 m. 6 f.  $166\frac{1}{2}$  yds. (8) £20. 4.  $0\frac{1}{2}$  nearly.  
 (9) £. 0. 15.  $4\frac{1}{10}\frac{8}{10}$ . (10) 73·34491.

## PAPER LXVI.

- (1) 3·6947. (2) 3 tons 3 qrs. 9·296 lbs. (3) 9·88.  
 (4) £51. 4. 0 more. (5)  $1\frac{6}{11}\frac{12}{11}$  years. (6)  $117\frac{1}{2}$ . (7)  $3\frac{1}{2}$  per cent.  
 (8) 135 dys. 15 h. 26 m. 6 sec. (9) £152847. (10)  $2\frac{3}{5}\frac{7}{5}$  years.

## PAPER LXVII.

- (1) £3. 10. 0. (2)  $18\frac{1}{2}\frac{1}{2}$  per cent.; £8. 15. 0. (3) 158°.  
 (4)  $7^{\circ} 48' 58''$ ;  $52^{\circ} 30'$ ,  $60^{\circ}$  and  $67^{\circ} 30'$ . (5) 287; 123; 451.  
 (6) 11 acres. (7) 27·888701.  
 (8) A's gain £22. 10. 0; C's stock £383. 6. 8. (9) ·0015.  
 (10) Put back 3 m.  $15\frac{1}{4}\frac{9}{8}$  sec.

PAPER LXVIII.

- (1) 2016. (2) 35779. (3) 1.16. (4) £36. 18. 9½.  
(5) 5s. 4¾d. (6) £240. (7) £30000; £16. 17. 6. (8) 62.39.  
(9) 340, 380, 580; and 1100, 110, 9. (10) 75 and 72.

## PAPER LXIX.

- (1)  $84\frac{7}{10}$  yds.                      (2) £4. 2.  $1\frac{1}{4}$ .                      (3)  $4\frac{5}{7}$  hours.  
 (4)  $11\frac{2}{5}$  days.                      (5) £131. 7.  $8\frac{2}{3}\frac{9}{37}$ .  
 (6) £1. 3.  $6\frac{9}{10}$ ; £34. 8.  $0\frac{3}{8}$ .                      (7) £10 increase.                      (8) 6d.  
 (9) 15 lbs. 7 oz. 8 grs.                      (10) 292, 438, 511.

PAPER LXX.

- (1) £2. 8. 11 $\frac{6}{7}$ .      (2) 392 yards.      (3) 269 $\frac{3}{5}$ .  
(4) £35. 5. 4 $\frac{2}{3}$  increase.      (5) £110.      (6) £1. 12. 8 $\frac{3}{5}$ .  
(7) £327. 11. 8 $\frac{4}{5}$ .      (8) 1 $\frac{5}{7}$  $\frac{6}{7}$  $\frac{6}{7}$ d.      (9) £57. 13. 9.  
(10) 49 $\frac{1}{4}$  min. past 10.

## PAPER LXXI.

- (1)  $13\frac{1}{2}\%$  per cent.      (2) 2 h. 3 m. 2 sec.  
 (3) St Petersburg, 2 h. 1 m. 10 secs. p.m.; Berlin, 0 h. 53 m. 36 secs. p.m.;  
 Paris, 0 h. 9 m. 20 secs. p.m.; Dublin, 11 h. 34 m. 56 secs. a.m.;  
 New York, 7 h. 4 m. 8 secs. a.m.  
 (4) 863906, &c.      (5) 20 tons 17 cwt. 1 qr.  $16\frac{1}{2}$  lbs.  
 (6) 30 qrs.  $1\frac{1}{2}$  bus.      (7) 1578 m. 1 fur.  $73\frac{1}{8}$  yds.  
 (8) £1. 3. 7-095.      (9) £474. 14. 11 $\frac{3}{4}$ .      (10)  $4\frac{1}{2}$  deg. C.; 86 deg. F.

PAPER LXXII.

- (1) 625-01376. (2) 11 $\frac{1}{5}$ . (3) £5. 5. 0. (4) 130007; .0921.  
 (5) 8s. 8 $\frac{1}{2}$ d. (6) 72. (7) £6. 5. 10 $\frac{1}{2}$ .  
 (8) 15s. 9d.; £1. 3s. 3 $\frac{3}{4}$ d. (9) 15s. 2 $\frac{1}{2}$ d. (10) 999.

PAPER LXXIII.

- (1) 136.66791. (2) 4.015356. (3) £40.1. 7½ nearly.  
 (4) £240; £6720. (5) £227. 14. 5 $\frac{4}{10}$ Γ. (6) £4750.  
 (7) 3 $\frac{1}{13}$  hours. (8) 1 $\frac{10}{13}$  hours; 5 $\frac{5}{8}$  hours. (9) £163. 17. 6.  
 (10) £39235. 4. 7 $\frac{7}{8}$ ; £1656. 15. 0.

## PAPER LXXIV.

- (1) 8 per cent.                      (2) 134·79151.                      (3) £21. 18. 6 $\frac{3}{4}$ .  
 (4) £4. 4. 4.                      (5) 15s. 4 $\frac{4}{5}$ d.                      (6) 6s. 8d.; 18s.; 5s. 4d.  
 (7) £2247. 3. 9·27.                      (8) 8s. 9d.                      (9) £47. 7. 7 $\frac{1}{2}$ .                      (10) £600.

## PAPER LXXV.

- (1) 113 sq. m. 62·464 acres.                      (2) £201. 15. 8 $\frac{1}{2}$  increase.  
 (3) £51. 6. 8 gain: 2 $\frac{9}{7}$  gain per cent.                      (4) £154. 16. 10 $\frac{3}{4}$  nearly: £1000.  
 (5) (i) 27 $\frac{3}{11}$  min. past 5; (ii) 10 $\frac{1}{11}$  m. past 5 and 43 $\frac{7}{11}$  m. past 5;  
       (iii) 57 $\frac{3}{11}$  m. past 5.  
 (6) L. & N. W. Ry. £10242. 3. 9; L. C. & D. Ry. £7550; G. W. Ry.  
       £6117. 3. 9; Midland, £4078. 2. 6.  
 (7) 6.                      (8) 208·303743.  
 (9) 6832·8 per cent.; 517·4 per cent.; 274·3 per cent.; 166·6 per cent.;  
       and 548022 inhabitants.  
 (10) A, 15s.; B, 12s.; C, 9s.; D, 6s.

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